Unit Tests: Workbook 6

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Patterns & Algebra

Unit Test

Section A

1. For the following pattern, use the first three numbers in the pattern to find the rule. Then continue the pattern by filling in the blanks:
   a) 22, 27, 32, _____, _____, _____  The rule is: _________________________________
   b) 48, 45, 42, _____, _____, _____  The rule is: _________________________________
   c) 1028, 1019, 1010, _____, _____, _____  The rule is: _________________________________

2. Extend the number pattern. How many squares would be used in the 6th figure?

   a)  

   b)  

   c)  

3. The snow is 11 cm deep at 3 p.m. 6 cm of snow falls each hour. How deep is the snow at 7 p.m.?

4. Una’s candle is 28 cm high when she lights it at 7 p.m. It burns down 3 cm every hour. Mona’s candle is 30 cm high when she lights it at 7 p.m. It burns down 4 cm every hour. Whose candle is taller at 11 p.m.?
Patterns & Algebra

Unit Test

Name: _____________________________
Date: _________________

Section A (continued)

5. Circle the core of the pattern. Then continue the pattern:
   a) ○ △ ○ ○ △ ○ _____ _____ _____ _____ _____
   b) 3  5  3  7  1  3  5  3  7  1  ____  ____  ____  ____  ____

6. Draw a rectangle around the core of the pattern:

   R Y Y R R Y Y R R Y Y R R Y Y R

7. Megan plants a row of daisies (the first flower) and pansies in the pattern shown here:

   a) How long is the core of the pattern?
   b) Is the 45th flower a daisy or a pansy?

8. Explain how you could find the colour of the 37th block in this pattern without using a hundreds chart:
   HINT: How could skip counting help?

9. What is the 21st coin in this pattern? Explain how you know.
Patterns & Algebra
Unit Test

Section A (continued)

10. Find the lowest common multiple of each pair of numbers:

   a) 6 and 10  
      LCM = _____

   b) 5 and 15  
      LCM = _____

   c) 2 and 9  
      LCM = _____

11. Every 6th person who arrives at a book sale receives a free calendar and every 8th person receives a free book. Which of the first 50 people receive a book and a calendar?

12. Find the amount by which the sequence increases or decreases. At each step, write your answer in the circles with a + or – sign:

   a) 8, 2, 14, 16, 1
   b) 16, 23, 4, 90, 2

13. a) Which row of the chart has a decreasing pattern? (Looking left to right.)

   b) Which column has a repeating pattern?

   c) Write pattern rules for the first and second column:

   d) Describe the relationship between the numbers in the third and fourth columns:

   e) Describe one other pattern in the chart:

   f) Name a row or column that does not appear to have any pattern:
Patterns & Algebra

Unit Test

Section B

14. Create an increasing number pattern. Give the rule for your pattern:

15. Create a repeating pattern using...
   a) letters:
   b) shapes
   c) numbers

16. Wendy makes brooches using squares (s), rectangles (r), and triangles (t). Complete the chart. Write a formula (like $4 \times s = t$) for each design:

   a)
   
   b)

   Squares (s) | Rectangles (r) | Triangles (t)
   1          |                |
   2          |                |
   3          |                |
   4          |                |
   5          |                |
   6          |                |

17. For each chart, give a rule that tells you how to make the OUTPUT numbers from the INPUT numbers:

   a) INPUT | OUTPUT
   4       | 11
   5       | 12
   6       | 13

   Rule:

   b) INPUT | OUTPUT
   3       | 12
   5       | 14
   7       | 16

   Rule:

   c) INPUT | OUTPUT
   19      | 6
   15      | 2
   21      | 8

   Rule:
Patterns & Algebra

Unit Test

Section B (continued)

18. Complete the T-Table for the following pattern. Then write a rule that tells you how to calculate the output numbers from the input number:

   NOTE: Use the word INPUT in your answer: For instance, “multiply the INPUT by 3.”

   Number of White Hexagons | Number of Shaded Hexagons
   ---------------------------|-----------------------------
   |                           |                             |
   Rule:

19. Write the rule that tells you how to make the OUTPUT from the INPUT:

   NOTE: Each rule involves two operations: either multiplication and addition, or multiplication and subtraction.

   a) INPUT | OUTPUT
   1   |   9
   2   |   12
   3   |   15

   Rule:

   b) INPUT | OUTPUT
   1   |   3
   2   |   8
   3   |   13

   Rule:

   c) INPUT | OUTPUT
   1   |   10
   2   |   12
   3   |   14

   Rule:

20. Draw Figure 4 and fill in the T-table. Write a rule for calculating the Number of Squares from the Figure Number.

   Figure | Number of Squares
   1   |
   2   |
   3   |
   4   |

   Rule for T-table: ________________________________

   Use your rule to predict the number of squares needed for Figure 10: ____________________________
Section A

1. a) 37, 42, 47; Start at 22 and add 5.
   b) 39, 36, 33; Start at 48 and subtract 3.
   c) 1001, 992, 983; Start at 1028 and subtract 9.

2. Fig. | # of Sq
   a) 4 | 24
       5 | 31
       6 | 38
   b) 4 | 17
       5 | 21
       6 | 25
   c) 4 | 17
       5 | 22
       6 | 27

3. The snow will be 35 cm deep at 7 p.m.

4. Una’s candle will be taller at 11 p.m. (16 cm vs 14 cm).

5. a) Core = □ △ □ ; □ △ □ △ □
   b) Core = 3 5 3 7 1; 3 5 3 7 1
   c) Core = ▢ ▣ ▢ ▣ ▣

6. Core = □ □ □ □ □ ; □ □ □ □ □

7. a) 3 flowers long
    b) Pansy

8. Sample Answer:
The core is 3 blocks long. I could skip count by 3’s until I got closest to 37 without going over (36). The first block in the core (37 – 36) is yellow, so the 37th block would be yellow.

9. The 21st coin would be a quarter (using a similar process to #8 above).

10. a) LCM = 30
    b) LCM = 15
    c) LCM = 18

11. The 24th and 48th people will receive both a book and a calendar.

12. a) – 6, + 12, + 2, – 15
    b) + 7, – 19, + 86, – 86

13. a) Row 3 or Row 5
    b) Column 5
    c) Column 1: Start at 0 and add 6. Column 2: Start at 5 and add 2.
    d) If you divide each number in Column 3 by 2, you will get the corresponding number in Column 4.
    e) Answers will vary.
    (e.g. Column 4: Start at 5 and subtract 1.)
    f) Rows 2, 4, 5 do not follow a clear pattern

14. Answers will vary.

15. a) Answers will vary.
    b) Answers will vary.
    c) Answers will vary.

16. a) S | R
    1 | 4
    2 | 8
    3 | 12
    4 × s = r

    b) S | T
    1 | 6
    2 | 12
    3 | 18
    6 × s = t

17. a) Input + 7 = Output
    b) Input + 9 = Output
    c) Input – 13 = Output

18. | White Hexagons | Shaded Hexagons |
   1 | 2
   2 | 4
   3 | 6

   RULE: Multiply the INPUT (# of white hexagons) by 2.

19. a) RULE: Multiply INPUT by 3 and add 6.
    b) RULE: Multiply INPUT by 5 and subtract 2.
    c) RULE: Multiply INPUT by 2 and add 8.

20. Figure 4:

<table>
<thead>
<tr>
<th>Figure</th>
<th># of Squares</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>9</td>
</tr>
</tbody>
</table>

For Figure 10, you would need 21 squares.
Section A

1. Write the name of the place value of each underlined digit:
   a) 1 278 930 __________________________ b) 842 208 __________________________
   c) 2 007 217 __________________________ d) 42 600 __________________________
   e) 842 _______________________________ f) 9 000 460 __________________________

2. Write numerals for the following number words:
   a) twenty-nine thousand, six hundred forty-three _______________
   b) eighty thousand, two hundred four _______________
   c) fifty-one thousand thirty-nine _______________

3. Write number words for the following numerals:
   a) 2 180 __________________________________________________________
   b) 13 008 _________________________________________________________
   c) 1 019 800 _______________________________________________________
      _______________________________________________________________

4. Expand the following numbers using numerals and words:
   a) 18 060 = ______________________________________________________________________
   b) 819 = ______________________________________________________________________
   c) 38 349 = ______________________________________________________________________

5. Sketch a base ten model of each number, then write the number in expanded form using number words and using numerals:
   a) 3 622 b) 4 387
      3 622 = __________________________
      3 622 = __________________________
      3 622 = __________________________
Number Sense
Unit Test

Section A (continued)

6. Write an inequality to show which number is greater:
   a) 8 643 □ 8 786  b) 6 267 □ 8 232  c) 8 000 □ 6 999  d) 3 979 □ 6 001
   e) 37 855 □ 37 122  f) 87 226 □ 87 934  g) 153 002 □ 177 244

7. In the questions below, you will have to regroup two or three times:
   a) 1 000  b) 1 00  c) 1 040
   \[ -5 7 3 \]
   \[ -3 1 \]
   \[ -4 5 8 9 \]

8. This chart gives the area of some of the largest lakes in North America:
   
<table>
<thead>
<tr>
<th>Lake</th>
<th>Area (in km²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erie</td>
<td>25 693</td>
</tr>
<tr>
<td>Great Slave</td>
<td>28 568</td>
</tr>
<tr>
<td>Michigan</td>
<td>58 016</td>
</tr>
<tr>
<td>Great Bear</td>
<td>31 339</td>
</tr>
<tr>
<td>Superior</td>
<td>82 103</td>
</tr>
</tbody>
</table>

   a) How much more area does the largest lake cover than the smallest lake?
   b) How much more area does Lake Michigan cover than Lake Erie?
   c) Write the areas of the lakes in order from least to greatest:
   d) The largest lake in the world is the Caspian Sea in Russia. Its area is 370 990 km². How much smaller than the area of the Caspian Sea is the area of Lake Superior?

9. Write 10, 100, 1 000 or 10 000 in the box to make the statement true:
   a) 256 + □ = 266  b) 5 673 + □ = 5 773  c) 9 328 + □ = 10 328
   d) 57 264 + □ = 67 264  e) 85 043 – □ = 84 943  f) 81 263 – □ = 80 263
Section A (continued)

10. Use each of the digits 4, 5, 6, 7, 8 once to create…

   a) The greatest odd number possible:
   b) a number between 57,000 and 56,700:
   c) An even number whose tens digit and hundreds digit add to 12:
   d) An odd number whose thousands digit is twice its hundreds digit:

11. Circle the prime numbers:
   a) 11 25 14 13 17 20
   b) 27 15 12 18 29 33

12. Draw a factor tree for the following numbers:
   a) 18
   b) 24

13. Find two pairs of prime numbers less than 20 that differ by 4:

14. Multiply:
   a) $\begin{array}{c}
   \times \\
   5 \ 3 \ 2 \\
   \hline \\
   3 \ 4
   \end{array}$
   b) $\begin{array}{c}
   \times \\
   5 \ 4 \ 5 \\
   \hline \\
   3 \ 8
   \end{array}$
   c) $\begin{array}{c}
   \times \\
   3 \ 1 \ 0 \\
   \hline \\
   3 \ 8
   \end{array}$

15. A hummingbird flaps its wings 15 times. How many times does it flap its wings in a minute?
Number Sense
Unit Test

Section B

16. Find two different ways to share 29 pens into equal groups so that one pen is left over:

17. Divide:

a) \[ \begin{array}{c|c|c}
3 & 8 & 1 \\
\hline
& & \\
\hline
& & \\
\hline
& & \\
\end{array} \]

b) \[ \begin{array}{c|c|c}
4 & 8 & 4 \\
\hline
& & \\
\hline
& & \\
\hline
& & \\
\end{array} \]

c) \[ \begin{array}{c|c|c}
5 & 6 & 4 \\
\hline
& & \\
\hline
& & \\
\hline
& & \\
\end{array} \]

d) \[ \begin{array}{c|c|c|c}
25 & 7 & 0 & 5 \\
\hline
& & & \\
\hline
& & & \\
\hline
& & & \\
\end{array} \]

18. Jason eats 8 almonds a day. How many days will he take to eat 104 almonds?

19. What is the least number of whole apples that can be shared equally among 2, 3, or 4 people?

20. Nandita ran 24 laps of her school track. The track is 75 metres long.
   a) How far has she run?
   
   b) How much further must she run if she wants to run 2000 metres?
   
   c) About how many extra laps must she run?
Number Sense

Unit Test

Section B (continued)

21. Sterling packs 59 books into boxes of 5, and Philip packs 47 books into boxes of 6. Who uses more boxes? Who has more left over?

22. Share the squares equally among the sets:

   a) How many cards did he put in the book? __________
   b) If each page held only 5 cards, how many pages would he need to place the cards? __________
   c) How many cards did he have before he gave half of his collection away? __________

24. These thermometers show the temperatures on Thursday and Friday.
   a) In the blanks, write an integer for each temperature.
   b) How much did the temperature change?

<table>
<thead>
<tr>
<th>Thursday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>-25</td>
<td>-25</td>
</tr>
<tr>
<td>-20</td>
<td>-20</td>
</tr>
<tr>
<td>-15</td>
<td>-15</td>
</tr>
<tr>
<td>-10</td>
<td>-10</td>
</tr>
<tr>
<td>-5</td>
<td>-5</td>
</tr>
<tr>
<td>0°C</td>
<td>0°C</td>
</tr>
<tr>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>25</td>
<td>30</td>
</tr>
</tbody>
</table>

-25°C  0°C  10°C  20°C  25°C  30°C
-25°C  0°C  10°C  15°C  20°C  25°C  30°C
Number Sense

Unit Test

Section B (continued)

25. How many negative integers are greater than \(-6\)?

26. Round to the nearest thousands place:
   a) 4 787  
   b) 93 092  
   c) 723 871  

27. Round to the nearest ten thousands place:
   a) 82 839  
   b) 43 003  
   c) 397 603  

28. Round 81 649 to the nearest…

   _____  _____  _____  _____  ten thousands
   _____  _____  _____  thousands
   _____  _____  hundreds  tens

29. Estimate the products by rounding to the leading digits:
   a) 45 \times 75 =  
   b) 427 \times 56 =  
   c) 306 \times 17 =  
   d) 81 \times 819 =  

30. The population of New Brunswick and Nova Scotia are listed in an almanac as 750 000 and 936 900.
    What digit do you think these numbers have been rounded to? Explain.

31. The population of Newfoundland is 520 200 and the population of Prince Edward Island is 137 900.
    Estimate the difference in the two populations. Explain how you estimated the difference.
Number Sense

Unit Test

Section C

32. How much money would you have if you had the following coins? Write your answer in cent notation then in dollar notation:
   a) 35 pennies = _____ = ______
   b) 7 nickels = _____ = ______
   c) 8 dimes = _____ = ______
   d) 28 pennies = _____ = ______
   e) 6 toonies = _____ = ______
   f) 3 quarters = _____ = ______

33. Circle the greater amount of money in each pair:
   a) 183¢ or $1.86
   b) $1.41 or 143¢
   c) 7¢ or $0.70

34.

   ![Images of items with prices: $10.30, $39.95, $6.26, $2.74, $25.64, $45.47, $38.50, $32.89]

   a) If you bought a watch and a soccer ball, how much would you pay?

   b) Which costs more: a watch and a cap or a pair of pants and a soccer ball?

   c) Could you buy a soccer ball, a pair of tennis rackets and a pair of pants for $100?

   d) What would be the total cost of the three most expensive things shown in the pictures above?

   e) Danny paid 2 $20 bills for the watch. Estimate his change.
Section C (continued)

35. Tanya’s weekly allowance is $4.50. Her mom gave her four coins. Which coins did she use?

36. Mera has $12.16 and Wendy has $13.47. How much more money does Wendy have than Mera?

37. First estimate the amount of money shown. Then tally the amount of each denomination and use the space provided to calculate the actual total:

   Estimated Total: _______________

   Actual Total: _______________

38. Draw a picture to show how to make the following amounts with the least number of coins and bills:

   a) $64

   b) $97

   c) $78.73
### Section A

1. a) Hundred thousands  
   b) Ten thousands  
   c) Hundreds  
   d) Tens  
   e) Ones  
   f) Millions  

2. a) 29 643  
   b) 80 204  
   c) 51 039  

3. a) Two thousand one hundred eighty  
   b) Thirteen thousand eight  
   c) One million nineteen thousand eight hundred  

4. a) 1 ten thousands + 8 thousands + (0 hundreds +) 6 tens + (0 ones)  
   b) 8 hundreds + 1 ten + 9 ones  
   c) 3 ten thousands + 8 thousands + 3 hundreds + 4 tens + 9 ones  

5. a) Teacher to check base ten model.  
   3 622 = 3 thousands + 6 hundreds + 2 tens + 2 ones  
   3 622 = 3 000 + 600 + 20 + 2  

b) Teacher to check base ten model.  
   4 387 = 4 thousands + 3 hundreds + 8 tens + 7 ones  
   4 387 = 4 000 + 300 + 80 + 7  

6. a) <  
   b) <  
   c) >  
   d) <  
   e) >  
   f) <  

### Section B

16. Answers will vary:  
   a) 27  
   b) 21  
   c) 129 R3  
   d) 282 R5  

17. 13 days  

18. 12 apples  

20. a) 1 800 m  
   b) 200 m  
   c) 2 laps + 50 m OR  
   \( \frac{2}{3} \) laps  

21. Sterling uses more boxes (11); Philip has more boxes left over (5).  

22. 4 squares in each of 6 sets  

23. a) 405  
   b) 81  
   c) 810  

24. a) Thursday: – 10ºC  
   b) 35ºC  

25. 5 (– 5, – 4, – 3, – 2, – 1)  

26. a) 5 000  
   b) 93 000  
   c) 724 000  

27. a) 80 000  
   b) 40 000  
   c) 400 000  

28. 10s: 81 650  
   100s: 81 600  
   1000s: 82 000  
   10 000s: 80 000  

29. a) 50 × 80  = 4 000  
   b) 400 × 60  = 24 000  
   c) 300 × 20  = 6 000  
   d) 80 × 800  = 64 000
30. Looking at the populations, it seems that one is rounded to the nearest ten thousands (750 000) and the other, to the nearest hundreds (936 900). However, in an almanac both numbers would be rounded to the same digit. If they’re both rounded to the same digit, they must both be rounded to the nearest hundreds.

31. Answers will vary as students may round the numbers to different digits (e.g. to the nearest hundred thousands, ten thousands or thousands). Teacher to check.

### Section C

32. a) 35¢ = $0.35  
    b) 35¢ = $0.35  
    c) 80¢ = $0.80  
    d) 28¢ = $0.28  
    e) 1200¢ = $12.00  
    f) 75¢ = $0.75  

33. a) $1.86  
    b) 143¢  
    c) $0.70  

34. a) $32.89 + $10.30 = $43.19  
    b) Watch and cap ($58.53 vs $50.25)  
    c) Yes – the total is $95.72.  
    d) $123.92 (for the tennis rackets, pants and shoes)  
    e) About $7.00 ($7.11)  

35. 2 × $2  
    2 × 25¢  

36. $1.31  

37. Actual Total = $72.86  

38. a) 3 × $20  
    2 × $2  
    b) 1 × $50  
    2 × $20  
    1 × $5  
    1 × $2  
    c) 1 × $50  
    1 × $20  
    1 × $5  
    1 × $2  
    1 × $1  
    2 × 25¢  
    2 × 10¢  
    3 × 1¢
Measurement
Unit Test

Section A

1. Answer the questions based on the given information on the weight of Canadian coins. Do your work in the space provided below.
   a) How much would 20 dimes weigh? ______________
   b) How much would 65¢ in nickels weigh? ______________
   c) How much would $1.50 in quarters weigh? ______________
   d) How much would 40 loonies weigh? ______________
   e) How many dimes weigh as much as 6 loonies? ______________
   f) How many pennies would weigh as much as 10 nickels? __________

   
2. Check off the appropriate box. Would you use grams or kilograms to weigh...
   a) a computer? □ g □ kg  
   b) a bed? □ g □ kg  
   c) a piece of bread? □ g □ kg  
   d) a frog? □ g □ kg  
   e) a pen? □ g □ kg  
   f) an apple? □ g □ kg

3. A dog weighs 4 kg. A cat weighs 2570 grams. How much more does the dog weigh? Show your work:

4. An insect weighs 250 mg.
   a) How many insects weigh 1 gram? Show your work:
   b) How many insects weigh 1 kg? Show your work:
Measurement
Unit Test

Section B

5. Find the volume of each box with the indicated dimensions (assume all units are in metres):

a) Width ________
   Length ________
   Height ________
   Volume ________

b) Width ________
   Length ________
   Height ________
   Volume ________

c) Width ________
   Length ________
   Height ________
   Volume ________

d) Width ________
   Length ________
   Height ________
   Volume ________

6. Marcus is building a pyramid with cubic centimetre blocks:

a) Fill in the volumes in each layer:
   Volume of top layer: ________
   Volume of second layer: ________
   Volume of bottom layer: ________

b) If Marcus added another row to his pyramid (following the same pattern), what would the total volume of the pyramid be? Explain.

7. A structure made of cubes each with volume 1 cm³ has this mat plan.
   What is the volume of the structure?
Measurement
Unit Test

Section B (continued)

8. This picture shows the top view of a cube built with cubic centimetres. What is the volume of the cube? Explain how you know:

9. How many millilitres are in a litre? ______________

10. Circle the greater measure in each pair:

<table>
<thead>
<tr>
<th>a) 25 g</th>
<th>35 mg</th>
<th>b) 20 g</th>
<th>17 kg</th>
<th>c) 3 L</th>
<th>5 mL</th>
</tr>
</thead>
<tbody>
<tr>
<td>d) 50 g</td>
<td>2 kg</td>
<td>e) 400 mL</td>
<td>1 L</td>
<td>f) 2000 mL</td>
<td>1 L</td>
</tr>
</tbody>
</table>

11. Explain how you found the answers to Questions 10 d) and 10 f):

12. Circle True or False for each statement below:

a) You would measure the mass of a car in litres. True False

b) A gram is used to measure volume. True False

c) The contents of a can of pop are usually measured in kilograms. True False

d) Grams are used to measure the mass of objects. True False
Measurement
Unit Test

Section C

13. How much time passed?
   a) From 8:45 a.m. to 9:20 a.m.: _____________________________
   b) From 11:20 a.m. to 4:35 p.m.: _____________________________
   c) From 6:52 a.m. to 8:21 p.m.: _____________________________
   d) From 11:25 a.m. to 5:43 a.m.: _____________________________
   e) From 23:00 to 7:00: _____________________________
   f) From 22:51 to 14:43: _____________________________

14. Boat A left Halifax at 13:00, 1 hour before Boat B. Both boats travelled at a steady speed in the same direction.

<table>
<thead>
<tr>
<th>Time</th>
<th>13:00</th>
<th>14:00</th>
<th>15:00</th>
<th>16:00</th>
<th>17:00</th>
<th>18:00</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Distance from Halifax</strong></td>
<td><strong>Boat A</strong></td>
<td>0 km</td>
<td>5 km</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Boat B</strong></td>
<td>0 km</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>28 km</td>
</tr>
</tbody>
</table>

   a) How far apart were the boats at 18:00?

   b) How far from Halifax were both boats at 15:30? At 16:30?

   c) When did Boat B overtake Boat A?
Section A
1. a) 40 g
   b) 52 g
   c) 27 g
   d) 280 g
   e) 21 dimes
   f) 16 pennies
2. a) kg
   b) kg
   c) g
   d) g
   e) g
   f) g
3. $4000 - 2570 = 1430$ g
4. a) $1000 + 250 = 4$ insects
   b) 1 kg = 1000 g, so
      1 kg = $4 	imes 1000 = 4000$ insects

Section B
5. a) W = 2 m
   L = 2 m
   H = 2 m
   V = $8$ m$^3$
   b) W = 4 m
   L = 5 m
   H = 4 m
   V = $80$ m$^3$
   c) W = 2 m
   L = 4 m
   H = 1 m
   V = $8$ m$^3$
   d) W = 4 m
   L = 4 m
   H = 8 m
   V = $128$ m$^3$
6. a) Top = 1 cm$^3$
    Second = 9 cm$^3$
    Bottom = 25 cm$^3$
    b) Following the pattern, the volume of the new layer would be:
       $7 	imes 7 = 49$ cm$^3$;
       So total volume
       $= 1 + 9 + 25 + 49$
       $= 84$ cm$^3$
7. 15 cm$^3$
8. 27 cm$^3$
   (length = 3 and width = 3
   so, as a cube, height = 3
   and $3 	imes 3 	imes 3 = 27$)
9. 1000 mL = 1 L
10. a) 25 g
    b) 17 kg
    c) 3 L
    d) 2 kg
    e) 1 L
    f) 2000 mL
11. For 10 d), convert both measures to grams (2 kg = 2000 g, which is greater than 50 g).
    For 10 f), convert both to millilitres (1 L = 1000 mL is less than 2000 mL).
12. a) False
    b) False
    c) False
    d) True

Section C
13. a) 35 min
    b) 5 hrs 15 min
    c) 11 hrs 29 min
    d) 18 hrs 18 min
    e) 8 hrs
    f) 15 hrs 52 min
14. | Time  | Boat A (km) | Boat B (km) |
    |-------|-------------|-------------|
    | 13:00 | 0           | 0           |
    | 14:00 | 5           | 0           |
    | 15:00 | 10          | 7           |
    | 16:00 | 15          | 14          |
    | 17:00 | 20          | 21          |
    | 18:00 | 25          | 28          |
   a) 3 km apart
   b) Distance from Halifax:
   c) At 16:30
Section A

1. Rene’s class has a fish tank. It contains a variety of small fish, each with different characteristics:

   Complete the table. Then sort fish into Venn diagram.

<table>
<thead>
<tr>
<th>Category</th>
<th>Fish (by letter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish with a pattern</td>
<td>A,</td>
</tr>
<tr>
<td>Dark fish</td>
<td>B,</td>
</tr>
</tbody>
</table>

2. Use the above line graph to answer the following questions:

   a) In which month did Anne drink: (i) the most smoothies? (ii) the least smoothies?

   b) How many smoothies did Anne drink: (i) in March? (ii) in October?

   c) In which months did Anne drink more than 6 smoothies?
3. In order to identify how their fellow students got to school, a Grade 5 class at Baldwin Public School designed a short survey and gave it to every student in the school.

   a) Using the final results (below), complete the bar graph provided:

      HINT: In this bar graph, the bars will run horizontally. The first one has been done for you.

<table>
<thead>
<tr>
<th>Transportation Used to Get to School</th>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bike</td>
<td>66</td>
</tr>
<tr>
<td>Subway</td>
<td>33</td>
</tr>
<tr>
<td>Walk</td>
<td>138</td>
</tr>
<tr>
<td>Bus</td>
<td>156</td>
</tr>
<tr>
<td>Car</td>
<td>22</td>
</tr>
</tbody>
</table>

Next, answer the following questions:

b) Identify the scale used in the bar graph (e.g. what it counts by and when it stops). Do you think it was a good choice? Why or why not?

c) How do the students at your school get to school? Would you predict similar or different results than those at found at Baldwin PS? Explain.

4. Melanie surveyed her friends about their favourite authors. Here are her results:

<table>
<thead>
<tr>
<th>J.K. Rowling</th>
<th>Lemony Snicket</th>
<th>Tamora Pierce</th>
<th>Cornelia Funke</th>
<th>Louis Sachar</th>
<th>Kenneth Opel</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>4</td>
<td>6</td>
<td>7</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

If you were Melanie, how would you choose to display your data? Why?
5. Ms Young’s Grade 5 class carried out an experiment: each day (for 12 days) they dropped 10 pennies on the ground. They counted the number of pennies that came up “heads” and created the following scatter plot graph:

![Scatter plot graph]

Read the scatter plot carefully and complete the result chart below (the first day has been done for you):

<table>
<thead>
<tr>
<th>Day</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Pennies</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. The following graph from a newspaper article shows how many new planets have been discovered by astronomers:

![Bar graph]

a) How many more planets were discovered in 2002 than in 2004?

b) In which years were more than 15 planets discovered?

c) Between which years were at least 5 planets discovered each year?
Section B

7. Find the range of the following data sets:
   HINT: Don’t forget to re-write the list in order from lowest to highest first!
   a) 45, 27, 14, 95, 44, 8
   b) 124, 46, 34, 71, 24, 355
   c) 56, 37, 7, 44, 28, 422, 80

   Range: _____ to _____  Range: _____ to _____  Range: _____ to _____

8. Find the mean of the following data sets:
   a) 5, 1, 7, 2, 8, 7
   \[
   \frac{5 + 1 + 7 + 2 + 8 + 7}{6} = \frac{30}{6} = 5
   \]
   Mean: ________
   
   b) 6, 3, 7, 15, 11, 10, 11
   \[
   \frac{6 + 3 + 7 + 15 + 11 + 10 + 11}{7} = \frac{61}{7}
   \]
   Mean: ________
   
   c) 17, 6, 12, 4, 21
   \[
   \frac{17 + 6 + 12 + 4 + 21}{5} = \frac{58}{5}
   \]
   Mean: ________

9. Find the mode of the following data sets:
   a) 3, 8, 8
   Mode: ________
   
   b) 30, 22, 52, 30
   Mode: ________
   
   c) 7, 7, 4, 5, 7, 4, 7, 9
   Mode: ________
   
   d) 53, 57, 35, 57, 75, 58
   Mode: ________
   
   e) 18, 88, 81, 8, 88, 88, 18
   Mode: ________
   
   f) 17, 17, 4
   Mode: ________

10. Find the median of the following data sets:
   HINT: Don’t forget to rewrite the list in order from lowest to highest first!
   a) 10, 18, 4, 13, 5
   
   \[
   10, 13, 14, 18, 5
   \]
   Median: ________
   
   b) 32, 33, 63, 16, 8, 13, 19
   
   \[
   8, 13, 16, 19, 32, 33, 63
   \]
   Median: ________
   
   c) 72, 22, 43, 6, 61, 77, 18
   
   \[
   6, 18, 22, 43, 61, 72, 77
   \]
   Median: ________
Section B (continued)

11. Mrs. Gatlin gave her students a spelling test (marked out of 20) and entered all the marks in the chart:

\[
\begin{array}{cccccccc}
11 & 14 & 18 & 10 & 11 & 15 & 10 & 16 & 9 \\
19 & 15 & 19 & 19 & 20 & 20 & 19 & 20 & 5 \\
\end{array}
\]

a) Create a stem and leaf plot of the data.

b) Find the range, mode, median, and mean of the data. Which is hardest to read from stem and leaf plot?

range: ________
mode: ________
median: ________
mean: ________

c) Tom’s mark is 15. Which of the following statements he told his parents were true? Explain using the mean, mode, and median.

i) My grade is average.
ii) I am in the top half of the class!
iii) This is the most common mark!

12. Marisa made a scatter plot of her pet rabbits’ weight:

a) How many months does the interval shown by the arrow represent?

b) How many weeks does the interval represent?

c) Describe any trends you see in the graph.

d) Circle on the graph the point that shows a 6 month old rabbit with weight of 500g.
Section A

1. With a pattern: A, D, E, G
   Dark fish: B, D, H

2. a) (i) August
    (ii) April
   b) (i) 10 smoothies
    (ii) 15 smoothies
   c) January, March, July, August, September, October, November

3. a) Teacher to check.
   b) The scale starts at 0, “counts” by 20 and ends at 160.
      Yes, this is a good scale because it covers the entire range of data (22 to 156) in the space given.
   c) Answers will vary – teacher to check.

4. Answers will vary.
   NOTE: A pie graph or bar graph should be used, rather than a line graph or a scatter plot.

5. Day    # of Pennies
    1    7
    2    3
    3    6
    4    2
    5    3
    6    7
    7    4
    8    5
    9    8
   10    3
   11    5
   12    5

6. a) 25 more (31 – 6)
   b) 2000, 2001, 2002
   c) From 1998 to 2004

Section B

7. a) 8 to 95
   b) 24 to 355
   c) 7 to 422

8. a) 5
   b) 9
   c) 12

9. a) 8
   b) 30
   c) 7
   d) 57
   e) 88
   f) 17

10. a) 10
    b) 19
    c) 43

11. a) [Stem | Leaves]
      0   | 59
      1   | 001455689999
      2   | 000

   b) Range: from 5 to 20.
      Mode: 16
      Median: 15.5
      Mean: 15
      Mean is hardest to read from stem and leaf plot.

   c) i) is True, the average grade is the mean.
      Tom’s grade is below the median, so ii) is false, and the most common mark is the mode, 19, so iii) is also false.

12. a) 1.5 months (3 ÷ 2)
    b) Approximately 6 weeks (1.5 × 4)
    c) The rabbits’ weights increase over time (but the incremental amount of weight gained gets smaller as time goes along).
    d) Teacher to check
Section A

1. Complete the chart. Find as many shapes as you can for each shape name:

<table>
<thead>
<tr>
<th>Shapes</th>
<th>Letters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triangles</td>
<td></td>
</tr>
<tr>
<td>Quadrilaterals</td>
<td></td>
</tr>
</tbody>
</table>

2. Without using a protractor, identify each angle as “acute” or “obtuse”:
   a) _____________
   b) _____________
   c) _____________

3. Use the charts to classify the triangles below. NOTE: Triangles are not drawn to scale.

   a) Classify the triangles by their angles:

<table>
<thead>
<tr>
<th>Property</th>
<th>Triangles with Property</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute-angled</td>
<td></td>
</tr>
<tr>
<td>Obtuse-angled</td>
<td></td>
</tr>
<tr>
<td>Right-angled</td>
<td></td>
</tr>
</tbody>
</table>

   b) Classify the triangles by their sides:

<table>
<thead>
<tr>
<th>Property</th>
<th>Triangles with Property</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equilateral</td>
<td></td>
</tr>
<tr>
<td>Isosceles</td>
<td></td>
</tr>
<tr>
<td>Scalene</td>
<td></td>
</tr>
</tbody>
</table>
Geometry
Unit Test

Section A (continued)

4. Measure all of the angles in each triangle and write your measurement in the triangle. Then say whether the triangle is **acute**, **obtuse** or **right** angled:

   a) 
   
   b) 
   
   c) 
   

5. Can a triangle be equilateral and obtuse? Explain.

6. Using arrows, mark all the pairs of parallel lines in the figures below:

   a) 
   
   b) 
   
   c) 
   
   d) 
   

   ____ pairs  ____ pairs  ____ pairs  ____ pairs

7. (i) Mark the angles that are right angles in the quadrilaterals below.

   (ii) Measure the length of each side with a ruler and write it onto the pictures. Use this to help you decide on the best (or most specific) name for each quadrilateral.

   a) 
   
   b) 
   

   Name: __________________________  Name: ______________________________

8. Match the name of the quadrilateral to the best description:

   - **Square**
   - **Rectangle**
   - **Rhombus**

   A parallelogram with 4 right angles.
   A parallelogram with 4 equal sides.
   A parallelogram with 4 right angles and 4 equal sides.
9. Name the shapes: HINT: Use the words rhombus, square, parallelogram and rectangle.
   a) __________________
   b) __________________
   c) __________________
   d) __________________

10. For each quadrilateral, say how many pairs of sides are parallel. Then identify each quadrilateral as a square, a rectangle, a parallelogram or a trapezoid:
    a) __________________
       __________________
    b) __________________
       __________________
    c) __________________
       __________________
    d) __________________
       __________________

11. Which special quadrilaterals have diagonals that intersect at a right angle? List all names that apply.

12. a) Why is a rhombus a parallelogram?
    b) Why are some parallelograms not rhombi?

13. a) Draw a quadrilateral that has two right angles and one pair of parallel sides.
    b) What is the name of the shape you drew?
Section B

14. a) Draw a triangle that is not congruent to the one shown:

![Triangle](image)

b) Draw a trapezoid congruent to the one shown, but turned on its side:

![Trapezoid](image)

15. Some of the shapes below are congruent. Find any shapes that are congruent to Shape A and label them with the letter A. If you can find any other shapes that are congruent to each other, label them all with the same letter.

HINT: You will need to use the letters A, B, C and D.

![Shapes](image)

16. Which shapes are congruent? Which are similar? Explain how you know:

![Shapes](image)
Section B (continued)

17. Complete the picture so that the dotted line is a line of symmetry:

a) 

b) 

c) 

d) 

18. a) Using the line provided, use a protractor to construct a triangle with two 60° angles:

b) Measure the sides of the triangle. (Write the measurements on the sides.) What kind of triangle did you draw?

c) What is the order of rotational symmetry of this triangle?

19. a) Draw a trapezoid with one line of symmetry and a trapezoid with no lines of symmetry and no right angles:

b) Draw a parallelogram:
Geometry

Unit Test

Section B (continued)

20. Record the properties of each shape. Write “yes” in the column if the shape has the given property. Otherwise, write “no”:

21. Describe this figure completely. In your description you should mention the following properties:

- Number of sides
- Number of vertices
- Number of pairs of parallel sides
- Is the figure equilateral?
- Number of right, obtuse and acute angles
- Number of lines of symmetry
- Order of rotational symmetry

22. I have three sides. Two of my sides are the same length. What am I?
Section A

1. Shapes | Letters
---|---
Triangles | B
Quadrilaterals | A, D, F, G, H
Pentagons | C, I
Hexagons | E, J

2. a) acute
b) obtuse
c) acute

3. a) \[ \text{Property} \quad \text{Triangles} \]
   
   | Acute-angled | A |
   | Obtuse-angled | D |
   | Right-angled | B, C |

4. a) acute
b) obtuse
c) right

5. No – if you draw an equilateral triangle, you can see that all the angles will be acute:

6. a) 1 pair
b) 2 pairs
c) 1 pair
d) 2 pairs

7. a) Name: parallelogram
b) Name: square

8. Square:
   A parallelogram with 4 right angles and 4 equal sides.

   Rectangle:
   A parallelogram with 4 right angles.

   Rhombus:
   A parallelogram with 4 equal sides.

9. a) rectangle
b) parallelogram
c) square
d) rhombus

10. a) 2 pairs; rectangle
    b) 2 pairs; parallelogram
    c) 2 pairs; square
    d) 1 pair; trapezoid

11. Kite, rhombus, square

12. a) Because it has 2 pairs of parallel sides
b) It depends on the shape's adjacent sides – if they're not equal, the shape is a parallelogram, not a rhombus.

13. a) Answers will vary.
b) trapezoid
    Example: 

Section B

14. a) Answers will vary – teacher to check.
b) Answers will vary – teacher to check.

15. Two A's:
Three B's:
Two C's:
Two D's:

**remaining shapes aren't congruent with anything

16. Congruent: A & H
   Similar: A & F and H & F.
   Teacher to check explanation.

17. a) 
    b) 
    c)
    d)

18. a) Teacher to check.
b) equilateral
c) Rotational symmetry of order 3.

19. a) Answers will vary.
    Examples:
    One line of symmetry -
    No lines of symmetry and no right angles -

20. 
   Q E 2+ 90º Ac Obt
   A N Y N N Y N N
   B Y N N Y Y Y N
   C N Y N N N Y N
   D Y N Y Y N N

21. Description should include the following details:
   ✓ 6 sides
   ✓ 6 vertices
   ✓ 3 pairs of parallel sides
   ✓ equilateral
   ✓ no right angles
   ✓ no acute angles
   ✓ 6 obtuse angles
   ✓ 6 lines of symmetry
   ✓ rotational symmetry of order 3

22. Isosceles triangle
Patterns & Algebra

Unit Test

Section A

1. Find the gap between the numbers, then write a rule for the pattern:
   a) 2, 3, 5, 8, 12
   Rule: _______________________________________________________________________
   b) 5, 7, 4, 6, 3
   Rule: _______________________________________________________________________
   c) 34, 33, 30, 25, 18
   Rule: _______________________________________________________________________
   d) 18, 21, 26, 33, 42
   Rule: _______________________________________________________________________

2. Extend each pattern for the next three terms. Then write a rule for the pattern.
   a) 237, 243, 249, 255, 261, _____, _____, _____
   Rule: _______________________________________________________________________
   b) 6, 10, 7, 11, 8, 12, _____, _____, _____
   Rule: _______________________________________________________________________
   c) 47, 45, 42, 38, _____, _____, _____
   Rule: _______________________________________________________________________

3. Use the letters of the alphabet to continue the following patterns:
   A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
   a) A, D, G, J, _____, _____
   b) Z, Y, W, T, _____, _____
   c) Z, X, V, T, _____, _____
   d) A, C, F, J, O, _____
Patterns & Algebra

Unit Test

Section A (continued)

4. Figure out how each of the patterns below was made, and then find the missing terms:
   a) 7, 12, 17, 22, 27, _____, _____  
   b) 23, 25, 28, 30, 33, _____, _____  
   c) 1, 5, 13, 29, 61, _____, _____  
   d) 53, 55, 59, 65, 73, _____, _____  
   e) 1, 3, 6, 10, 15, _____, _____  
   f) 1, 2, 4, 8, 16, _____, _____  
   g) 55, 51, 47, 43, 39, _____, _____  
   h) 67, 69, 64, 66, 61, _____, _____  
   i) 210, 220, 230, 240, 250, _____, _____  
   j) .3, .9, 1.5, 2.1, 2.7, _____, _____

5. Solve each equation.
   a) n + 2 = 5  
   b) n – 3 = 8  
   c) 5n = 20  
   d) 4 + x = 15  
   e) 12 – n = 10  
   f) 12 ÷ A = 3

6. Write an algebraic equation that tells you the relationship between the numbers in Column A and Column B.
   a)  
<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>14</td>
</tr>
<tr>
<td>3</td>
<td>21</td>
</tr>
</tbody>
</table>

   b)  
<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>7</td>
</tr>
</tbody>
</table>
Patterns & Algebra
Unit Test

Section B

7. Draw a graph for each T-table below:

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
</tr>
</tbody>
</table>

8. Ben and Tom run a 120 m race.
   a) How far from the start was Tom after 20 seconds?
   b) How far from the start was Ben after 30 seconds?
   c) How many seconds from the start did Tom catch up to Ben?

9. The graph shows the cost of renting a bike from Mike’s store.
   a) How much would you pay to rent the bike for 6 hours?
   b) Dave’s store charges $3.00 an hour for a bike. Whose store would you rent from if you wanted the bike for 5 hours?
10. The picture shows how many chairs can be placed at each arrangement of tables:
   a) Make a T-table and state a rule that tells you how to calculate the number of chairs from and the number of tables:

   b) How many chairs can be placed at 12 tables?

11. Andy has $30 in his bank account. He saves 25 dollars each month. How much does he have in his account after 10 months?

12. A recipe calls for 5 cups of flour for every 6 cups of water. How many cups of water will be needed for 25 cups of flour? Show your work:

13. Jo-Leigh’s basket holds 24 apples and Emily’s basket holds 36 apples. They each collected less than 100 apples. How many baskets did they collect if they collected the same number of apples?
14. Find the mystery numbers:

   a) I am a two-digit number divisible by 6 and 8. My ones digit is 4. I am less than 40.

   b) I am between 20 and 40. I am a multiple of 7. My tens digit is two less than my units digit.

15. What is the 63rd term in this pattern? Explain how you know.

16. A camp offers two ways to rent a canoe: you can either pay $7.50 for the first hour and $3.50 for every hour after that OR you can pay $5.00 for every hour. If you wanted to rent a canoe for 5 hours, which way would you choose to pay? Show your work:
17. The picture below shows how the temperature inside a cloud changes at different heights:

   a) Does the temperature increase or decrease at greater heights?

   b) What distance does the arrow represent in real life?
      Show your work:

   c) Measure the length of the arrow. What is the scale of the picture?
      ______ cm = ____________ m

   d) Do the numbers in the sequence of temperatures decrease by the same amount each time?

   e) If the pattern in the temperature continued, what would the temperature be at 1400 m?

18. Marlene says she will need 27 blocks to make Figure 7.
    Is she right? Explain:

   Figure 1  Figure 2  Figure 3
**Unit Test: Patterns & Algebra – Workbook 6, Part 2**

**Section A**

1. a) **Gaps:**
   1, 2, 3, 4
   **Rule:**
   Start at 2. Add 1, then 2, then 3…
   (Each step you are adding one more than the step before.)

   b) **Gaps:**
   2, – 3, 2, – 3
   **Rule:**
   Start at 5. Add 2 and then subtract 3. Repeat.

   c) **Gaps:**
   – 1, – 3, – 5, – 7
   **Rule:**
   Start at 34. Subtract 1, then 3, then 5…
   (Each step you are subtracting two more than the step before.)

   d) **Gaps:**
   3, 5, 7, 9;  
   **Rule:**
   Start at 18. Add 3, then 5, then 7…
   (Each step you are adding two more than the step before.)

2. a) 267, 273, 279
   **Rule:**
   Start at 237. Add 6. Repeat.

   b) 9, 13, 10;
   **Rule:**
   Start at 6. Add 4 and then subtract 3. Repeat.

   c) 33, 27, 20;
   **Rule:**
   Start at 47. Subtract 2, then 3, then 4…
   (Each step you are subtracting one more than the step before.)

3. a) M, P
   b) P, K
   c) R, P
   d) U

4. a) 32, 37
   b) 35, 38
   c) 125, 253
   d) 83, 95
   e) 21, 28
   f) 32, 64
   g) 35, 31
   h) 63, 58

   i) 260, 270
   j) 3.3, 3.9

5. a) n = 3
   b) n = 11
   c) n = 4
   d) x = 11
   e) n = 2
   f) A = 4

6. a) B = 7 × A or B = 7A
   b) B = A + 3

**Section B**

7. a) **Graph**

   b) **Graph**

8. a) 80 m
   b) 80 m
   c) 15 seconds

9. a) $16.00
   b) Renting from Dave’s store would cost:
   $3.00 / hour × 5 hours = $15.00

   From the graph, we can see that renting from Mike’s store would cost $14.00.

   So… I would choose Mike’s store because it is $1.00 cheaper.

10. a) **Table**

      | Tables | Chairs |
      |--------|--------|
      | 1      | 6      |
      | 2      | 10     |
      | 3      | 14     |

   Multiply the numbers of chairs by 4 and add 2.
   b) 4 × 12 + 2 = 48 + 2 = 50 chairs

11. After 10 months, Andy would have:

   $30 + ($25 × 10)
   = $30 + $250
   = $280

   **NOTE:** Students may also choose to use a T-table.

12. | Flour | Water |
    |-------|-------|
    | 5     | 6     |
    | 5 × 2 = 10 | 6 × 2 = 12 |
    | 5 × 3 = 15 | 6 × 3 = 18 |
    | 5 × 4 = 20 | 6 × 4 = 24 |
    | 5 × 5 = 25 | 6 × 5 = 30 |

   So 30 cups of water will be needed for 25 cups of flour.

13. Since Jo-Leigh and Emily both collected the **same** number of apples, we are looking for a shared number in the following T-tables – that is also less than 100:

<table>
<thead>
<tr>
<th>Jo-Leigh</th>
<th># of apples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>2</td>
<td>24 × 2 = 48</td>
</tr>
<tr>
<td>3</td>
<td>24 × 3 = 72</td>
</tr>
<tr>
<td>4</td>
<td>24 × 4 = 96</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Emily</th>
<th># of apples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>36</td>
</tr>
<tr>
<td>2</td>
<td>36 × 2 = 72</td>
</tr>
<tr>
<td>3</td>
<td>36 × 3 = 108</td>
</tr>
</tbody>
</table>

   So both girls collected 72 apples, which means that Jo-Leigh collected 3 baskets and Emily collected 2.

14. a) 24
   b) 35

15. The pattern repeats itself every 5 shapes (i.e. the core has a length of 5) and 63 ÷ 5 = 12 R3.

   This means that the pattern would repeat itself 12 times fully, and then you would need to go 3 more shapes to get to the 63rd one.

   So the 63rd shape is the same as the 3rd shape in the core, which is a square.
16. **Option 1:**
   \[ \$7.50 + (\$3.50 \times 4) = \$7.50 + \$14.00 = \$21.50 \]
   **Option 2:**
   \[ \$5.00 \times 5 = \$25.00 \]
   Therefore, students should choose Option 1 since it is cheaper.

17. **a)** The temperature decreases at greater heights.

   **b)** The top height is 1,000 m above earth and, using the dotted lines, we see that the arrow represents \( \frac{1}{5} \) of that height:
   
   \[ \frac{1}{5} \text{ of } 1,000 = 1,000 \div 5 = 200 \text{ m} \]

   **c)** 1 cm = 200 m

   **d)** Yes, each 200 m height increase results in a temperature drop of 2.5°C.

   **e)** At 1,000 m, the temperature is 11.5°C – using the information from parts c) and d), we know that:
   - The temperature at 1,200 m is:
     \[ = 11.5° – 2.5° \]
     \[ = 9.0°C \]
   - And the temperature at 1,400 m is:
     \[ = 9.0° – 2.5° \]
     \[ = 6.5°C \]

18. **Figure** | **Blocks**

<table>
<thead>
<tr>
<th>Figure</th>
<th>Blocks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>6</td>
<td>21</td>
</tr>
<tr>
<td>7</td>
<td>28</td>
</tr>
</tbody>
</table>

   No, Marlene is not right – from the T-table we see that Figure 7 requires 28 blocks.
**Number Sense**

*Unit Test*

**Section A**

1. A field hockey team wins 8 games and loses 5 games:
   a) How many games did the team play?  
   b) What fraction of the games did the team win?  
   c) Did the team win more than half its games? Explain how you know.

2. The following chart shows the number of walls in a house that were painted a particular colour:

<table>
<thead>
<tr>
<th>Colour</th>
<th>Number of Walls</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>6</td>
</tr>
<tr>
<td>Yellow</td>
<td>3</td>
</tr>
<tr>
<td>Blue</td>
<td>2</td>
</tr>
<tr>
<td>Green</td>
<td>1</td>
</tr>
</tbody>
</table>

   a) What fraction of the walls were painted green? ________  
   b) What colour was used to paint one fourth of the walls? _______  
   c) What colour was used to paint one half of the walls? ________

3. Write the fractions in order from least to greatest:
   a) $\frac{2}{7}, \frac{1}{7}, \frac{5}{7}$  
   b) $\frac{2}{12}, \frac{2}{6}, \frac{2}{7}, \frac{2}{3}, \frac{2}{14}$  
   c) $\frac{9}{18}, \frac{9}{11}, \frac{9}{19}$

4. Shade one piece at a time until you have shaded the amount of pie given in bold. *There may be more pies than you need:*
   a) $1 \frac{1}{2}$  
   b) $2 \frac{1}{4}$

5. Shade one piece at a time until you have shaded the amount of pie given in bold. *There may be more pies than you need:*
   a) $\frac{10}{3}$  
   b) $\frac{9}{4}$
**Number Sense**

*Unit Test*

**Section A (continued)**

6. Cut each pie into smaller pieces to make an equivalent fraction:

   a) \[ \frac{2}{3} = \frac{6}{9} \]

   b) \[ \frac{2}{3} = \frac{6}{9} \]

   c) \[ \frac{1}{2} = \frac{4}{8} \]

7. A pizza is cut into 8 pieces. Each piece has at least one topping: hot peppers, mushrooms or both. \( \frac{3}{4} \) of the pizza is covered in hot peppers. \( \frac{5}{8} \) of the pizza is covered in mushrooms. Draw a picture to show how many pieces have both hot peppers and mushrooms on them:

8. Find the fraction of the whole amount by sharing the cookies equally:
   
   **HINT:** draw the correct number of plates then place the cookies one at a time. Then circle the correct amount.

   a) Find \( \frac{2}{3} \) of 6 cookies.

   \[ \frac{2}{3} \text{ of } 6 = \frac{4}{3} \]

   b) Find \( \frac{3}{4} \) of 12 cookies.

   \[ \frac{3}{4} \text{ of } 12 = \frac{9}{2} \]

9. Find the fraction of the whole number:

   a) \( \frac{2}{3} \) of 9 = ______

   b) \( \frac{3}{4} \) of 8 = ______

   c) \( \frac{3}{4} \) of 12 = ______

   d) \( \frac{2}{3} \) of 15 = ______

   e) \( \frac{3}{5} \) of 25 = ______

   f) \( \frac{2}{7} \) of 14 = ______

   g) \( \frac{3}{4} \) of 100 = ______

   h) \( \frac{3}{7} \) of 21 = ______
Number Sense

Unit Test

Section A (continued)

10. Write the fractions in order from least to greatest by first changing the fractions to fractions with the same denominator:
   a) \( \frac{1}{2} \), \( \frac{2}{5} \), \( \frac{7}{10} \)
   b) \( \frac{1}{3} \), \( \frac{1}{2} \), \( \frac{5}{6} \)
   c) \( \frac{1}{2} \), \( \frac{3}{4} \), \( \frac{5}{8} \)

11. Draw a picture to show which fraction is greater:
   a) \( 2 \frac{1}{2} \) or \( \frac{5}{3} \)

12. Bagels come in bags of eight. How many bagels are in \( 2 \frac{3}{4} \) bags?

13. Shade \( \frac{2}{5} \) of the squares.
    Draw stripes in \( \frac{1}{4} \) of the squares.

14. Twelve children had drinks for lunch. \( \frac{2}{3} \) had juice. \( \frac{1}{4} \) had water.
   a) How many children had juice?
   b) How many had water?
   c) How many did not have either drink?
Number Sense

Unit Test

Section B

15. Write a fraction and a decimal for each shaded part:

16. Fill in the missing numbers:
   a) \(\frac{94}{100} = \) tenths hundredths
   b) \(\frac{37}{100} = \) tenths hundredths
   c) \(\frac{41}{100} = \) tenths hundredths
   d) \(\frac{05}{100} = \) tenths hundredths

17. Write as a decimal:
   a) 8 tenths 3 hundredths =
   b) 0 tenths 7 hundredths =
   c) 3 tenths 2 hundredths =
   d) 0 tenths 5 hundredths =

18. Write the following decimals as fractions. Reduce your answers where possible:
   a) \(0.6 = \)
   b) \(0.53 = \)
   c) \(0.04 = \)
   d) \(0.1 = \)
   e) \(0.48 = \)

19. Change the following fractions to decimals:
   a) \(\frac{76}{100} = \)
   b) \(\frac{6}{100} = \)
   c) \(\frac{46}{100} = \)
   d) \(\frac{8}{100} = \)

20. Using numbers and words, write the amount of tenths and hundredths in each of the following decimals:
   a) \(.3 = \) tenths
      \(\) hundredths
   b) \(.05 = \) tenths
      \(\) hundredths
   c) \(.97 = \) tenths
      \(\) hundredths
Section B (continued)

21. Write the numbers in order from least to greatest by first changing each decimal or fraction to a fraction with a denominator of 10:
   a) 0.8, 0.3, 0.4  
   b) \( \frac{7}{10}, 0.2, \frac{1}{10} \)  
   c) 0.3, 0.6, \( \frac{2}{5} \)  
   d) 1.39, 1 \( \frac{30}{100} \), 1 \( \frac{49}{100} \)

22. Write the following fractions as decimals:
   a) \( \frac{875}{1000} = \)  
   b) \( \frac{25}{1000} = \)

23. Compare each pair of decimals by writing < or > in the box:
   HINT: Add zeroes wherever necessary to give each number the same number of digits.
   a) .275 < .273  
   b) .27 < .123  
   c) .596 < .7  
   d) 1.7 > 1.6

24. Line up the decimals and add or subtract the following decimals:
   a) 0.32 + 0.97 =  
   b) 0.64 − 0.23 =  
   c) 0.94 + 0.3 =

25. Find the products:
   a) 3 × 8.3 =  
   b) 8 × 2.63 =  
   c) 7 × .207 =

26. Divide:
   a) 0.3 ÷ 10 =  
   b) 0.5 ÷ 100 =
   c) 17:10 =  
   d) 27 ÷ 100 =
   e) 6.2 ÷ 100 =  
   f) .03 ÷ 10 =
Number Sense
Unit Test

Section B (continued)

27. Divide:

\[
8 \overline{1.44}
\]

28. Karen cycled 62.4 km in 4 hours. How many km did she cycle in an hour? Show your work:

29. Which is a better deal: 6 pens for $4.99 or 8 pens for $6.99? Show your work:

30. Round each decimal to the nearest tenth. Underline the hundredths digit first:
   a) \(.25\) b) \(.32\) c) \(.68\) d) \(1.35\)

31. Round each decimal to the nearest whole number. Underline the tenths digit first:
   a) \(3.25\) b) \(4.13\) c) \(2.95\) d) \(68.7\)

32. Add:
   a) \(3000 + 200 + 7 + 0.02 = \) b) \(10000 + 500 + 20 + 0.1 + .05 = \)

33. Which is greater: \(3.70\) or \(3.07\)? Explain.

34. Write a decimal…
   a) between \(4.257\) and \(4.253\): \(\) b) One thousandth greater than \(4.270\): \(\)
Number Sense

Unit Test

Section C

35. □ □ ○ ○ □ □ ○ ○ □ □ □

a) What does the ratio 2 : 3 describe (i.e. what shapes are being compared)?

b) What does the ratio 5 : 10 describe?

36. Solve the following ratios. Draw arrows to show what you multiply by:

a) \(\frac{3}{4} = \frac{20}{20}\)  
b) \(\frac{2}{3} = \frac{12}{12}\)  
c) \(\frac{6}{7} = \frac{35}{35}\)

d) \(\frac{15}{25} = \frac{100}{100}\)  
e) \(\frac{12}{20} = \frac{80}{80}\)  
f) \(\frac{21}{30} = \frac{90}{90}\)

37. Write the following percents as fractions:

a) 7% = \(\frac{7}{100}\)  
b) 92% = \(\frac{92}{100}\)  
c) 5% = \(\frac{5}{100}\)  
d) 50% = \(\frac{50}{100}\)  
e) 100% = \(\frac{100}{100}\)

38. Write the following fractions as percents:

a) \(\frac{2}{100}\) = 2%  
b) \(\frac{31}{100}\) = 31%  
c) \(\frac{52}{100}\) = 52%  
d) \(\frac{100}{100}\) = 100%  
e) \(\frac{88}{100}\) = 88%

39. Write each fraction as a percent by changing it to a fraction over 100:

a) \(\frac{2}{5}\)  
b) \(\frac{3}{4}\)  
c) \(\frac{1}{2}\)

40. Write the following decimals as a percents. Show your work:

a) .2  
b) .9

41. Change the following fractions to percents by first reducing them to lowest terms:

a) \(\frac{9}{15}\)  
b) \(\frac{3}{6}\)  
c) \(\frac{10}{40}\)
42. Write each set of numbers in order from least to greatest. (Change all of the numbers into fractions with denominator 100.)
   
   a) \(\frac{3}{5}, \quad 42\%, \quad .73\)  
   b) \(\frac{1}{2}, \quad .73, \quad 80\%\)

43. Find the following percents by first finding 10% of each number:
   
   a) 60% of 35  
   b) 40% of 24  
   c) 20% of 1.3

44. Find 15% of the following numbers by finding 10% and 5%.
   
   a) 60  
   b) 240  
   c) 12

45. The top of a pentagonal box has a perimeter of 3.85 m. How long is each side?

46. A family travelled in a car for 105 days. Gas cost $72 each week. How much money did they spend on gas?

47. Tony bought a book for $17.25 and a pen for $2.35. He paid 15% more in taxes. How much change did he receive from $25.00?
Section C (continued)

48. It took Cindy 20 minutes to finish her homework. She spent \( \frac{2}{5} \) of the time on math and \( \frac{1}{4} \) of the time on history.

a) How many minutes did she spend on math and history?

b) How many minutes did she spend on other subjects?

c) What percent of the time did she spend on other subjects?

49. In Angela’s class there are 30 children. 60% are girls. In Steven’s class there are 27 children. The ratio of boys to girls is 5:4. Which class has more boys?

50. Dianne copied the following data from a circle graph she saw on the web.

<table>
<thead>
<tr>
<th>Favourite Subjects of Grade 6 Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science</td>
</tr>
<tr>
<td>31%</td>
</tr>
</tbody>
</table>

a) How can you tell that she made a mistake?

b) Her mistake was in the last column. What should the percentage of students who prefer arts should be?

c) Draw the circle graph Dianne saw on the web.
Unit Test: Number Sense – Workbook 6, Part 2

Section A
1. a) 13
   b) \(\frac{8}{13}\)
   c) Yes – 13 + 2 = 6.5
   and 8 > 6.5, so the
   team won more than
   half its games.
2. From the chart, we can see
   that the house has a total
   of 12 walls.
   a) 1
   b) Yellow, since \(\frac{1}{4}\)
   = \(\frac{3}{12}\)
   c) White, since \(\frac{1}{2}\)
   = \(\frac{6}{12}\)
3. a) \(\frac{1}{7}\), \(\frac{2}{7}\), \(\frac{5}{7}\)
   b) \(\frac{2}{14}\), \(\frac{2}{12}\), \(\frac{2}{7}\), \(\frac{2}{6}\), \(\frac{2}{3}\)
   c) \(\frac{9}{19}\), \(\frac{9}{18}\), \(\frac{9}{11}\)
4. a) \(\frac{2}{3}\)
   b) \(\frac{5}{6}\)
5. a) \(\frac{1}{2}\)
   b) \(\frac{1}{4}\)
6. Teacher to check that
   students have cut pies
   properly:
   a) \(\frac{2}{3} = \frac{4}{6}\)
   b) \(\frac{2}{3} = \frac{6}{9}\)
   c) \(\frac{1}{2} = \frac{2}{4}\)
7. Sample Answer:
   Exact pictures may vary
   but, in all cases, 3 pieces
   will have both toppings.
8. a) \(\frac{2}{3}\) of 6 is 4
   b) \(\frac{3}{4}\) of 12 is 9
   9. a) 6
   b) 6
   c) 9
   d) 10
   e) 15
   f) 4
   g) 75
   h) 9
10. a) \(\frac{2}{5} \cdot \frac{1}{2} = \frac{7}{10}\)
   * first change fractions
     so denominator = 10
   b) \(\frac{1}{3} \cdot \frac{1}{2} \cdot \frac{5}{6}\)
   * first change fractions
     so denominator = 6
   c) \(\frac{1}{2} \cdot \frac{5}{8} \cdot \frac{3}{4}\)
   * first change fractions
     so denominator = 8
11. a) \(2\frac{1}{2} > \frac{5}{3}\)
   b) \(2\frac{1}{2}\): \(\frac{5}{3}\)
   c) \(\frac{5}{3}\)
12. 2 full bags will have:
   \(8 \times 2 = 16\) bagels
   and:
   \(\frac{3}{4}\) of 8 = 6 bagels
   So there will be 22 bagels
   \((16 + 6)\) in total.
13. Exact answers will vary –
   teacher to check.
14. a) \(\frac{2}{3}\) of 12 = 8
   b) \(\frac{1}{4}\) of 12 = 3
   c) One child \((12 – 8 - 3)\)
   had neither drink.
15. \(\frac{43}{100} = 0.43\)
    \(\frac{34}{100} = 0.34\)
    \(\frac{23}{100} = 0.23\)
16. a) 9 tenths
    b) 3 tenths
    c) 4 tenths
    d) 0 tenths
17. a) 0.83
    b) 0.32
    c) 0.05
    d) 0.005
18. a) \(\frac{6}{10} = \frac{3}{5}\)
    b) \(\frac{53}{100}\)
    c) \(\frac{4}{100} = \frac{2}{50} = \frac{1}{25}\)
    d) \(\frac{1}{10}\)
    e) \(\frac{8}{100} = \frac{24}{50} = \frac{12}{25}\)
19. a) 0.76
    b) 0.06
    c) 0.46
    d) 0.08
20. a) 3 tenths
    b) 0 tenths
    c) 9 tenths
21. a) \(0.3, 0.4, 0.8\)
    b) \(\frac{1}{10}, \frac{2}{10}, \frac{7}{10}\)
    c) \(0.3, \frac{2}{5}, 0.6\)
    d) \(\frac{30}{100}, 1.39, 1\frac{49}{100}\)
22. a) 0.875
    b) 0.025
23. a) \(>\)
    b) \(>\)
    c) \(<\)
    d) \(>\)
24. a) 1.29

Section B

Unit Tests – Workbook 6, Part 2
Section C

35. a) triangles : circles
   b) squares : all shapes

36. a) \( \frac{3}{4} = \frac{15}{20} \)
   b) \( \frac{2}{3} = \frac{8}{12} \)
   c) \( \frac{6}{7} = \frac{30}{35} \)
   d) \( \frac{15}{25} = \frac{60}{100} \)
   e) \( \frac{12}{20} = \frac{48}{80} \)
   f) \( \frac{24}{30} = \frac{63}{90} \)

37. a) \( 7 \times \frac{100}{100} = 7 \)
   b) \( 92 \times \frac{100}{100} = 92 \times \frac{50}{50} = \frac{23}{25} \)
   c) \( \frac{5}{100} \)
   d) \( \frac{50}{100} = \frac{1}{2} \)
   e) \( \frac{100}{100} = 1 \times 1 = 1 \)

38. a) 2%
   b) 31%
   c) 52%
   d) 100%
   e) 88%

39. a) 40%
   b) 75%
   c) 50%

40. a) \( 0.2 = \frac{20}{100} = 20\% \)
   b) \( 0.9 = \frac{90}{100} = 90\% \)

41. a) 60%
   b) 50%
   c) 25%

42. a) 42\% = \( \frac{3}{5} \), 0.73
   b) \( \frac{1}{2} \), 0.73, 80\%

43. a) 10\% of 35 = 3.5 and
   \( 3.5 \times 6 = 21 \)
   So:
   60\% of 35 is 21
   b) 10\% of 24 = 2.4 and
   \( 2.4 \times 4 = 9.6 \)
   So:
   40\% of 24 is 9.6

44. a) 10\% of 60 = 6 and
   5\% of 60 = 3
   So:
   15\% of 60 = 9 + 3
   = 12
   b) 10\% of 240 = 24 and
   5\% of 240 = 12
   So:
   15\% of 240 = 24 + 12
   = 36
   c) 10\% of 12 = 1.2 and
   5\% of 12 = 0.6
   So:
   15\% of 12 = 1.2 + 0.6
   = 1.8

45. \( 3.85 + 5 = 0.77 \text{ m} \)

46. There are 7 days in a week so, to find the number of weeks the family travelled, we use division:

\[ \frac{105 + 7}{7} = 15 \text{ weeks} \]

Price of gas:

\[ \$72 \text{ per week} \times 15 \text{ weeks} = \$1080 \]

So the family spent $1080 on gas.

47. The total of Tony's purchases was:

\[ \$17.25 + \$2.35 = \$19.60 \]

Taxes paid would then be 15\% of $19.60:

\[ 10\% \text{ of } $19.60 = \$1.96 \]

\[ 5\% \text{ of } $19.60 = \$0.98 \]

\[ 15\% \text{ of } $19.60 = \$2.94 \]

In total, Tony spent:

\[ $19.60 + $2.94 = $22.54 \]

So his change would be $2.46 ($25.00 – $22.54).

48. a) Cindy spent 8 minutes (\( \frac{2}{5} \text{ of } 20 \text{ minutes} \)) on math.

She spent 5 minutes (\( \frac{1}{4} \text{ of } 20 \text{ minutes} \)) on history.

So, in total, she spent 13 minutes (8 + 5) on these two subjects.
Measurement

Unit Test

Section A

1. Write a measurement in a whole number of cm that is between ...
   a) 83 mm and 75 mm: _____ cm    b) 36 mm and 66 mm  ______
   c) 34 mm and 5 cm:  _________

2. Find the numbers missing from the following charts:

<table>
<thead>
<tr>
<th>mm</th>
<th>cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>70</td>
</tr>
<tr>
<td>444</td>
<td>600</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>cm</th>
<th>dm</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td>420</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>m</th>
<th>dm</th>
</tr>
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<tbody>
<tr>
<td>240</td>
<td>100</td>
</tr>
<tr>
<td>35</td>
<td></td>
</tr>
</tbody>
</table>

3. Write a measurement in a whole number of dm that is between …
   a) 51 and 61 cm:  _________    b) 25 and 41 cm:  _________    c) 68 and 74 cm:  _________

4. The Sky Tower in New Zealand is 328 m high. About how many Sky Towers, laid end to end, would make a kilometre? Show your work:

5. Clare can cycle at a speed of 21 km/hr and Erin can cycle at a speed of 15 km/hr. How much further can Clare cycle in 3 hours than Erin? Show your work:

6. Helen walked 3 km in the first hour and then cycled 13 km in the second hour. How far did she travel? What was her average speed?
Measurement

Unit Test

Name: _____________________________

Date: _________________

7. Fill in the missing numbers:
   a) 10 cm = _____________ mm  
   b) 10 dm = _____________ cm  
   c) 10 dm = _____________ mm

8. Convert the measurement given in cm to a measurement using multiple units:
   a) 407 cm = _____ m _____ cm  
   b) 823 cm = _____ m _____ cm

9. Is 492 mm longer or shorter than 20 cm? Explain how you know:

10. For the questions below, you will need to multiply or divide by 10 or 100. Look at the units carefully and fill in the missing numbers and words in each step.

   a) Change 14 m to a measure in dm:
      i) The new units are _____ times _________
      ii) So I need _____ times __________ units
      iii) So I _______________ by _______
      14 m = _______ dm

   b) Change 23 cm to a measure in m:
      i) The new units are _____ times _________
      ii) So I need _____ times __________ units
      iii) So I _______________ by _______
      23 cm = _______ m

11. Change the units using the same steps as in Question 10.

   a) 3.5 mm = ___________ cm  
   b) 2.31 kg = _____________ g  
   c) 7 cm = ______________ m

   d) 14.62 mm = ___________ dm  
   e) 2.05 cm = _____________ dm  
   f) 152 mg = _____________ g

   g) 37 mL = _____________ L  
   h) 2.75 L = _____________ mL  
   i) 305 g = _____________ mg

12. Name any object in your classroom. Write down a unit of measurement that would be best for measuring it. Explain why it would be the best unit of measurement:
Measurement
Unit Test

Section B

13. Use a ruler to measure the perimeter of each figure (in cm):
   a) 
   b) 
   c) 

14. Find the perimeter of each shape. Be sure to include the units in your answer:
   a) 
       Perimeter __________
   b) 
       Perimeter __________
   c) 
       Perimeter __________
   d) 
       Perimeter __________

   e) Write the letters of the shapes in order from greatest perimeter to least perimeter. (Make sure you look at the units!)

15. Find the area of these figures in square centimetres:
   a) 
       Area = _______ cm²
   b) 
       Area = _______ cm²
   c) 
       Area = _______ cm²
16. Find the area (in cm²) of each of the given shapes:

Area of A = _________________
Area of B = _________________
Area of C = _________________

17. Find the area of the rectangles with the following dimensions:
   a) width: 6 m  length: 7 m  b) width: 3 m  length: 7 m  c) width: 4 cm  length: 8 cm

18. A rectangle has an area of 18 cm² and a length of 6 cm. What is its width?

19. Measure the length and width of each rectangle, then calculate its perimeter and area:

   a)  
      ![Rectangle](image)
      Perimeter = ______ cm
      Area = ______ cm²

   b)  
      ![Rectangle](image)
      Perimeter = ______ cm
      Area = ______ cm²

   c)  
      ![Rectangle](image)
      Perimeter = ______ cm
      Area = ______ cm²
20. Show all the ways you can make a rectangle with a perimeter of 12 units:

21. A rectangle has sides whose lengths are whole number of cm. Its area is 24 cm$^2$. Find all the possible rectangles of this sort:

22. Sally says she can find the area of a rectangle if she knows the perimeter of the rectangle and the length of one side. Is she correct? Explain with an example.
Measurement
Unit Test

Section B (continued)

23. Calculate the area of each shape. Show your work:
   a)  
   b)  
   c)  

24. Find the area of the following parallelograms:
   a) Base = 6 cm  
      Height = 8 cm  
      Area = _____
   b) Base = 2 cm  
      Height = 6 cm  
      Area = _____
   c) Base = 7 cm  
      Height = 2 cm  
      Area = _____
   d) Base = 5 cm  
      Height = 3 cm  
      Area = _____

25. Measure the base and height of the triangle using a ruler. Then find the area of the triangle:
   a)  
   b)  
   c)  

26. A parallelogram has base 8 cm and area 24 cm². How high is the parallelogram?

27. Each edge on the grid represents .5 cm. Is the perimeter of the rectangle greater than or less than .145 m? How do you know?
**Unit Test: Measurement – Workbook 6, Part 2**

### Section A

1. a) 8 cm  
   b) Answers may vary: 4, 5 or 6 cm  
   c) 4 cm  

2. 

<table>
<thead>
<tr>
<th>mm</th>
<th>cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>6</td>
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<tr>
<td>4440</td>
<td>444</td>
</tr>
<tr>
<td>70</td>
<td>7</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>cm</th>
<th>dm</th>
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<tbody>
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<tr>
<td>4200</td>
<td>420</td>
</tr>
<tr>
<td>600</td>
<td>60</td>
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</table>

<table>
<thead>
<tr>
<th>m</th>
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<tbody>
<tr>
<td>240</td>
<td>2400</td>
</tr>
<tr>
<td>10</td>
<td>100</td>
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<tr>
<td>35</td>
<td>350</td>
</tr>
</tbody>
</table>

3. a) 6 dm  
   b) Answers may vary: 3 or 4 dm  
   c) 7 dm  

4. 1 km = 1000 m, and:  
   \[ 1000 \div 328 = 3 \text{ R}16 \]  
   So it would take about 3 Sky Towers, laid end to end, to make a kilometre.  

5. In 3 hours, Clare can travel 21 km × 3 = 63 km  
   In 3 hours, Erin can travel 15 km × 3 = 45 km  
   *Difference:*  
   63 km – 45 km = 18 km  
   In 3 hours, Clare can cycle 18 km more than Erin.  

6. Total distance travelled:  
   3 km + 13 km = 16 km  
   *Average Speed:*  
   16 km ÷ 2 hours = 8 km/hr  
   Helen travelled 16 km, at an average speed of 8 km/hr.  

7. a) 100  
    b) 100  
    c) 1000  

8. a) 4 m 7 cm  
    b) 8 m 23 cm  

9. 492 mm is longer than 20 cm = 200 mm.  

10. a) i) 10 times smaller  
      ii) 10 times more units  
      iii) multiply by 10  
      \[ 14 \text{ m} = 140 \text{ dm} \]  
    b) i) 100 times larger  
      ii) 100 times less units  
      iii) divide by 100  
      \[ 23 \text{ cm} = 0.23 \text{ m} \]  

11. a) 0.35 cm  
    b) 2310 g  
    c) 0.07 m  
    d) 0.1462 dm  
    e) 0.205 dm  
    f) 0.152 g  
    g) 0.037 L  
    h) 2750 mL  
    i) 3050 mg  

12. Answers will vary.  
   Teacher to check.  

### Section B

13. a) 10 cm  
    b) 10 cm  
    c) 14 cm  

14. a) 28 m  
    b) 56 cm  
    c) 9 km  
    d) 36 cm  
    e) C, A, B, D  

15. a) 8 cm²  
    b) 8 cm²  
    c) 9 cm²  

16. Area of A = 6 cm²  
   Area of B = 8 cm²  
   Area of C = 12 cm²  

17. a) 42 m²  
    b) 21 m²  
    c) 32 cm²  

18. 18 ÷ 6 = 3  
   So the width of the rectangle is 3 cm.  

19. a) Length = 5 cm  
    Width = 2 cm  
    Perimeter = 14 cm  
    Area = 10 cm²  
    b) Length = 2 cm  
    Width = 1 cm  
    Perimeter = 6 cm  
    Area = 2 cm²  
    c) Length = 3 cm  
    Width = 2 cm  
    Perimeter = 10 cm  
    Area = 6 cm²  

20. Rectangle dimensions  
   (teacher to check student diagrams):  
   1 × 5  
   2 × 4  
   3 × 3 – since a square is also a rectangle  

21. 1 × 24  
2 × 12  
3 × 8  
4 × 6  

22. Yes, Sally is correct.  
   Explanation will vary.  
   Perimeter = (length + width)  
   × 2, so to get the width divide the perimeter by 2  
   and subtract the length.  
   Multiply the width by the length to get the area.  

23. a) 6 square units  
    b) 8.5 square units  
    c) 8.5 square units  

24. a) Area = 48 cm²  
    b) Area = 12 cm²  
    c) Area = 14 cm²  
    d) Area = 15 cm²  

25. a) Base = 6 cm  
    Height = 2 cm  
    Area = 6 cm²  
    b) Base = 4 cm  
    Height = 2 cm  
    Area = 4 cm²  
    c) Base = 4 cm  
    Height = 3 cm  
    Area = 6 cm²  

26. 24 ÷ 8 = 3  
   So the parallelogram is 3 cm high.  

27. The grey rectangle has a perimeter of 20 squares.  
   Since the edge of each square is 0.5 cm long, the perimeter of the rectangle is:  
   20 × 0.5 cm = 10 cm  
   And 10 cm = 0.1 m, which is less than .145 m.
Probability & Data Management

Unit Test

Section A

1. What are the possible outcomes for these spinners?

a) ___________ ___________ ______ outcomes
b) ___________ ___________ ______ outcomes
c) ___________ ___________ ______ outcomes

2. For each spinner, write the probability of spinning red. Reduce your answer if possible:

a) b) c) d) 

3. Write a fraction that gives the probability of spinning:

a) the number 4 b) the number 5
c) an even number d) an odd number
e) a number less than 7 f) a number greater than 3

4. Imogen throws a dart at this board. The dart can only land on the board. Write the probability of the dart landing on each colour:
Probability & Data Management

Unit Test

Section A (continued)

5. For each spinner below, what fraction of your spins would you expect to be red?

   a) I would expect ___ of my spins to be red.

   b) ____________________________

6. Label the balls red (R) or green (G) to match the probability of drawing a ball of the given colour:

   a) \( P(\text{Green}) = \frac{2}{3} \)
   
   \[
   \begin{array}{cccccc}
   & & & & & \\
   & & & & & \\
   & & & & & \\
   \hline
   & & & & &
   \end{array}
   \]
   
   b) \( P(\text{Red}) = \frac{1}{2} \) \( P(\text{Green}) = \frac{1}{4} \)

   \[
   \begin{array}{cccccc}
   & & & & & \\
   & & & & & \\
   & & & & & \\
   \hline
   & & & & &
   \end{array}
   \]

7. Use the words impossible, likely, unlikely or certain to describe the following events:

   a) If you flip a coin once, you will get a head and a tail: ________________

   b) If you roll a die once, you will get a number less than six: ________________

   c) Eight metres of snow will fall today: ________________

8. Write numbers on the spinners to match the probabilities:

   a) The probability of spinning a \( 3 \) is \( \frac{1}{4} \).

   b) The probability of spinning an even number is \( \frac{5}{6} \).

   c) The probability of spinning a multiple of 3 is \( \frac{2}{5} \).

   d) The probability of spinning a \( 2 \) is \( \frac{1}{2} \).

9. If you spun the following spinners 50 times, how many times would you expect to spin yellow? Show your work:

   a) _____ times

   b) _____ times
Section A (continued)

10. If you spun this spinner 21 times...
   a) How many of your spins would you expect to be green? Show your work.

   b) Which of these charts shows a result you’d be most likely to get? Explain.

   c) Which result would surprise you? Why?

11. The probability of spinning blue on a spinner is \(\frac{1}{3}\). If you used the spinner 100 times about how many times would you expect to spin blue?

12. Sketch a spinner on which the probability of spinning red is \(\frac{3}{4}\):
Probability & Data Management

Unit Test

Section B

13. If you flip a coin there are two outcomes: heads (H) and tails (T). Using the chart provided, list all the outcomes for flipping a coin and spinning the spinner given below:

<table>
<thead>
<tr>
<th>Coin</th>
<th>Spinner</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B • G</td>
</tr>
</tbody>
</table>

14. Draw a tree diagram to show all the combinations of numbers you could spin on these two spinners:

1 2 3 4

1 2

a) How many of the combinations add to four? _______

b) How many of the combinations have a product of four? _______

15. You have three coins in your pocket: a penny (P), a nickel (N) and a dime (D).

a) What are all the possible combinations of two coins you could pull out?
   HINT: Use alphabetical order to organize your answer.

b) Would you expect to pull a pair of coins that add to 6 cents? Are the chances likely or unlikely? Explain.
Section A

1. a) 1, 3, 5, 7; 4 outcomes
   b) 8; 1 outcome
   c) 2, 4, 6; 3 outcomes
2. a) \( P(R) = \frac{1}{4} \)
   b) \( P(R) = \frac{2}{5} \)
   c) \( P(R) = \frac{4}{8} = \frac{1}{2} \)
   d) \( P(R) = 0 \)
3. a) \( \frac{1}{8} \)
   b) \( \frac{2}{8} = \frac{1}{4} \)
   c) \( \frac{3}{8} \)
   d) \( \frac{5}{8} \)
   e) \( \frac{6}{8} = \frac{3}{4} \)
   f) \( \frac{4}{8} = \frac{1}{2} \)
4. Students should think of the board like this:
   
<table>
<thead>
<tr>
<th>B</th>
<th>B</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>B</td>
<td>R</td>
</tr>
<tr>
<td>G</td>
<td>B</td>
<td>R</td>
</tr>
</tbody>
</table>
   
   \( P(B) = \frac{3}{9} \)
   \( P(G) = \frac{1}{9} \)
   \( P(R) = \frac{3}{9} = \frac{1}{3} \)
5. a) I would expect \( \frac{2}{3} \) of my spins to be red.
   b) I would expect \( \frac{1}{4} \) of my spins to be red.
6. a) Teacher to check answer.
    4 red balls;
    8 green balls.
   b) Teacher to check answer.
    4 red balls;
    2 green balls.
7. a) Impossible
   b) Likely
   c) Unlikely
8. Answers will vary.
   Teacher to check.
9. a) 10 times since:
   \( P(Y) = \frac{1}{5} \)
   and \( \frac{1}{5} \) of 50 = 10
   b) 30 times since:
   \( P(Y) = \frac{3}{5} \)
   and \( \frac{3}{5} \) of 50 = 30
10. a) I would expect 7 of 21 spins to be green since:
    \( P(G) = \frac{1}{3} \)
    and \( \frac{1}{3} \) of 21 = 7
    b) Chart B.
    Reasons will vary.
    Teacher to check.
    c) Charts C and A are unexpected.
    Reasons will vary.
    Teacher to check.
11. The spinner is expected to be blue about 33 times out of 100 –
    \( P(B) = \frac{1}{3} \)
    and
    \( \frac{1}{3} \) of 100 = 33
    NOTE:
    Students have to round 33 R1 to 33 since the “number of times” has to be a whole number.
12. Answers will vary.
    Teacher to check.

Section B

13. | Coin | Spinner |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>B</td>
</tr>
<tr>
<td>H</td>
<td>G</td>
</tr>
<tr>
<td>T</td>
<td>B</td>
</tr>
<tr>
<td>T</td>
<td>G</td>
</tr>
</tbody>
</table>
14. Two possible answers:

15. | #1 | #2 | Sum |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>N</td>
<td>15¢</td>
</tr>
<tr>
<td>D</td>
<td>P</td>
<td>11¢</td>
</tr>
<tr>
<td>N</td>
<td>D</td>
<td>15¢</td>
</tr>
<tr>
<td>N</td>
<td>P</td>
<td>6¢</td>
</tr>
<tr>
<td>P</td>
<td>D</td>
<td>11¢</td>
</tr>
<tr>
<td>P</td>
<td>N</td>
<td>6¢</td>
</tr>
</tbody>
</table>
   b) The chance of pulling a pair of coins that adds to 6¢ are unlikely:
   \( P = \frac{2}{6} = \frac{1}{3} \)
   and \( \frac{1}{3} < \frac{1}{2} \)
**Section A**

1. Circle the points in the following positions (connecting the dots first, if necessary):
   a) ![Column 1](#) ![Row 2](#)  
   b) ![Column 2](#) ![Row 3](#)  
   c) ![Column 1](#) ![Row 2](#)  
   d) ![Column 2](#) ![Row 3](#)  

2. Circle the points in the following positions:
   a) ![Column 1](#) ![Row 2](#)  
   b) ![Column 2](#) ![Row 3](#)  
   c) ![Column 1](#) ![Row 2](#)  
   d) ![Column 2](#) ![Row 3](#)  

3. Graph each set of ordered pairs and join the dots to form a polygon. Identify the polygon drawn:
   a) ![Graph A](#)  
   b) ![Graph B](#)  
   A (0,2) B (0,4) C (4,4) D (4,2)  
   This polygon is a ________________.
   A (2,0) B (1,3) C (3,3) D (4,0)  
   This polygon is a ________________.

4. Write the coordinates of the following points:
   A ( , )  B ( , )  
   C ( , )  D ( , )  
   E ( , )  F ( , )  
   G ( , )  H ( , )  

---

*Unit Tests – Workbook 6, Part 2*
Geometry
Unit Test

Section B

5. Slide each shape 4 boxes to the right. (Start by putting a dot on one of the corners of the figure. Slide the dot four boxes right, then draw the new figure.)

   a) 
   b) 

6. Slide each figure 5 boxes to the right and 2 boxes down:

   a) 
   b) 

7. Draw the reflection (or flip) of the shapes below:

   a) 
   b) 
   c) 

8. Give two reasons why this picture does not show a reflection:

   [Diagram of a shape with a dashed line]
Section B (continued)

9. Show where the arrow would be after each turn:
   a) \[ \frac{1}{4} \text{ turn clockwise} \]
   b) \[ \frac{1}{2} \text{ turn counter clockwise} \]
   c) \[ \frac{1}{4} \text{ turn clockwise} \]
   d) \[ \frac{1}{2} \text{ turn counter clockwise} \]

10. Show what the figure would look like after the rotation. First rotate the dark line, then draw the rest of the figure:
   a) \[ \frac{1}{4} \text{ turn clockwise} \]
   b) \[ \frac{1}{2} \text{ turn clockwise} \]
   c) \[ \frac{3}{4} \text{ turn counter clockwise} \]
   d) \[ \frac{1}{4} \text{ turn counter clockwise} \]

11. Colour or shade in the sections of the left-hand square using at least 3 colours or shadings. Then create a border design by rotating the square \[ \frac{1}{4} \text{ turn clockwise} \] around the bottom right corner.
12. Shapes B, C, and D were obtained from shape A by using two transformations. Write the correct letter in the blank, and describe each transformation. For rotations, mark the centre of the rotation, for reflections, draw the mirror line.

_____ : Reflection and rotation

B:

_____ : Rotation and slide

C:

_____ : Reflection and slide

D:
Section C

13. Compare the sets of shapes below. Name the shapes first, and then write a paragraph outlining how they are the same and how they are different:

a) 

<table>
<thead>
<tr>
<th>Name</th>
<th>i –</th>
<th>ii –</th>
</tr>
</thead>
<tbody>
<tr>
<td>Same</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Different</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Geometry
Unit Test

Section C (continued)

b) 

<table>
<thead>
<tr>
<th>Name</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>i –</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ii –</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Same   |      |      |      |

| Different |      |      |      |

14. Complete the following property chart:

<table>
<thead>
<tr>
<th>Shape</th>
<th>Name</th>
<th>Number of...</th>
<th>Net</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>edges</td>
<td>vertices</td>
</tr>
</tbody>
</table>

* In each case, circle the base(s)
15. If you know how many sides the base of a prism has, how can you tell how many vertices the prism has? Explain.

16. Draw the front, top and side view of the figure given by this mat plan.
Section A

1. a) The polygon is a rectangle.
   b) The polygon is a parallelogram.
   c) 3 2 1 1 2 3
   d) 3 2 1 1 2 3

2. a) 3 2 1 A B C
   b) C B A X Y Z
   c) 2 1 0 0 1 2
   d) 2 1 0 0 1 2

3. a) 5 4 3 2 1 0 0 1 2 3 4 5
   b) The polygon is a parallelogram.

4. A (3, 2) B (9, 1) C (8, 4) D (6, 3) E (1, 1) F (4, 4) G (0, 5) H (5, 0)

Section B

5. NOTE: Location of dots may vary.
   a) t
   b) t

6. a) t
   b) t

7. a) t
   b) t
   c) t

8. The two shapes are not the same size and both shapes are facing the same direction (which is NOT a reflection).
   Exact answers may vary.
   Teacher to check.

9. a) t
   b) t
   c) t
   d) t

10. a) t
    b) t
    c) t
    d) t

11. Answers will vary.
    Teacher to check.

12. From top to bottom: C, D, B
    Descriptions will vary, teacher to check.
Section C

13. a) Name:
   i) Rectangular Prism
   ii) Triangular Prism

   Answers will vary, but should include:
   
   **Similarities:**
   - both are prisms
   - both have 2 bases
   - Non-base faces are rectangles
   
   **Differences:**
   - i) has 2 triangular bases
   - ii) has rectangular bases
   - Any pair of opposite faces can be considered bases in i) not so for ii)
   - # of edges, faces, vertices

b) Name:
   i) Rectangular Pyramid
   ii) Rectangular Prism

   Answers will vary, but should include:
   
   **Similarities:**
   - both have a rectangular base

   **Differences:**
   - i) has 1 base, ii) has 2 bases
   - # of edges, faces, vertices
   - The non-base faces are triangles in i) and rectangles in ii).
   - i) has a vertex opposite to the base, ii) doesn’t.

14. Hexagonal Pyramid
   edges – 12
   vertices – 7
   faces – 7

15. Triangular Prism
   edges – 9
   vertices – 6
   faces – 5

16. Answers may vary.
   Teacher to check.
   
   **Sample Answer:**
   Each vertex of a prism belongs either to the top or the bottom base.
   The bases have the same number of vertices, so the number of vertices of a prism is twice the number of vertices in the base.