Self-Assessment for Grade 10 Applied Math (MFM2P)

Students who are registered for Grade 10 Applied Math (MFM2P) may benefit from a self evaluation and review of the following expectations from Grade 9 Applied Math (MFM1P).

The questions in this self-assessment reflect some of the key ideas learned in prerequisite courses. They do not represent the problem solving approach or the rich experience that students would be exposed to in a classroom. The intention is for students to revisit some key concepts and, if needed, access review materials in an informal environment at a pace that is comfortable for the student.

Concept(s)	Sample Question	How comfortable do you feel with this concept?	Link(s) to explore concept further
I can add and subtract polynomials	1. Simplify: a. $(1-7h)+(-7h-1)$ b. c. $4xy-y^2-3x^2+2xy-x-3y^2$	 ☐ **Very comfortable**  ☐ **Somewhat comfortable**  ☐ **Not at all comfortable**	Adding and Subtracting Polynomials
I can multiply a single term by a polynomial	2. Expand and simplify: $2x(x^2+10x-5)-3(4x+3)$	 ☐ **Very comfortable**  ☐ **Somewhat comfortable**  ☐ **Not at all comfortable**	Multiplying a Polynomial by a Monomial

<table>
<tr>
<td>I can solve equations using a variety of strategies</td>
<td>3. Solve for the unknown:

a. $\frac{x}{-6}=3$
b. $\frac{x}{45}=\frac{11}{20}$

c. $2y+7=21$
d. $12-2x=-7x-1$</td>
<td>  ☐ Very comfortable
  ☐ Somewhat comfortable
  ☐ Not at all comfortable</td>
<td>Solving One- and Two-Step Equations

Solving Multi-Step Linear Equations</td>
</tr>
<tr>
<td>I can construct a table of values for a linear relationship</td>
<td>4. A student is paid 23¢ for each newspaper she delivers. Complete the table to show their earnings from delivering 25 to 100 newspapers.

<table>
<tr><th>Number of Newspapers</th><th>Earnings ($)</th></tr>
<tr><td>25</td><td></td></tr>
<tr><td>50</td><td></td></tr>
<tr><td>75</td><td></td></tr>
<tr><td>100</td><td></td></tr>
</table>
</td>
<td>  ☐ Very comfortable
  ☐ Somewhat comfortable
  ☐ Not at all comfortable</td>
<td>Intro to Linear Relations Application Problem</td>
</tr>
</table>

<table>
<tr>
<td>I can construct a graph for a linear relationship

I can determine how a graph, equation and table of values would change if the rate of change and/or initial value changes</td>
<td>5. The following is a table that represents the relationship between cost and number of toppings on a pizza.

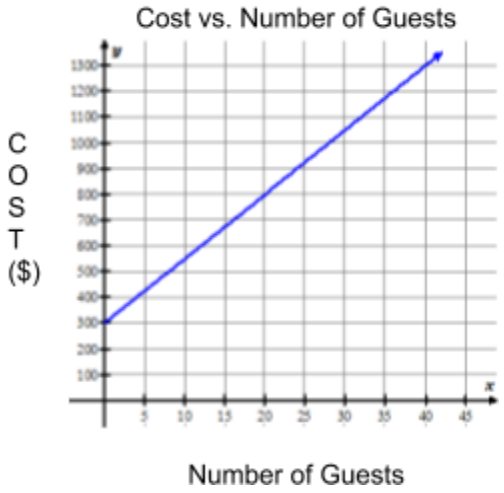
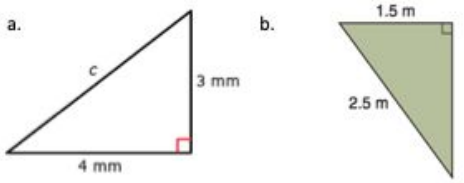
<table>
<tr><th>Number of toppings</th><th>Cost ($)</th></tr>
<tr><td>0</td><td>13.00</td></tr>
<tr><td>1</td><td>14.50</td></tr>
<tr><td>2</td><td>16.00</td></tr>
<tr><td>3</td><td>17.50</td></tr>
</table>

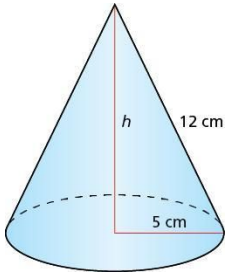
a. Describe, in words, how this pizza store determines the price of a pizza.
b. Graph the relation.
c. How would the table change if the cost per topping was $2?
d. How would the graph change if the cost of a basic pizza with no toppings was $12?</td>
<td>  ☐ Very comfortable
  ☐ Somewhat comfortable
  ☐ Not at all comfortable</td>
<td>Intro to Linear Relations Part 2</td>
</tr>
<tr>
<td>I can identify the initial value (constant) for a direct and partial relationship from a graph, table of values, equation and scenario

I can identify the rate of change for a situation

I can create a linear equation (partial and direct) from a graph by finding the</td>
<td>6. The graph below shows the cost of renting a banquet hall for a wedding, based on the number of guests.
a. Describe the graph.
b. Identify the initial value.
c. Identify the rate of change.
d. Write an equation for the linear relation, using the variable C to represent the cost and g to represent the number of guests.</td>
<td>  ☐ Very comfortable
  ☐ Somewhat comfortable
  ☐ Not at all comfortable</td>
<td>Intro to Linear Relations Part 2

Expression Versus Equation</td>
</tr>
</table>

initial value and the rate of change			
I can create a linear equation (partial and direct) from a scenario by finding the initial value and the rate of change	7. The charge for renting a tour bus is $100 for the bus plus $12 for each passenger. Write an equation to determine the cost, C dollars, to rent the bus, for a trip for *p* passengers.	 ☐ **Very comfortable**  ☐ **Somewhat comfortable**  ☐ **Not at all comfortable**	Expression Versus Equation
I can solve problems using the Pythagorean theorem as needed in problems	8. Find the missing side length: 	 ☐ **Very comfortable**  ☐ **Somewhat comfortable**  ☐ **Not at all comfortable**	The Pythagorean Theorem

I can solve problems involving the volumes of prisms, pyramids, cylinders, cones and spheres	9. A can of soda has a diameter of 6 cm and a height of 13 cm. How much soda does it hold? 10. The diagram shows a closed cone. a.Calculate the height. b. Find the volume.  	 ☐ **Very comfortable**  ☐ **Somewhat comfortable**  ☐ **Not at all comfortable**	Volume of a Cylinder Volumes of Pyramids and Cones

Solutions to Sample Questions:

1. Simplify:
   a. $(1-7h)+(-7h-1) = -14h$
   b. $(5g+3)+(2g+4) = 7g+7$
   c. $4xy-y^2-3x^2+2xy-x-3y^2 = -3x^2+6xy-4y^2-x$

2. Expand and simplify:
   $2x(x^2+10x-5)-3(4x+3) = 2x^3+20x^2-22x-9$

3. Solve for the unknown:
   a. $\frac{x}{-6}=3$ $\quad x=-18$
   b. $\frac{x}{45}=\frac{11}{20}$ $\quad x=\frac{495}{20}$ *or* $\frac{99}{4}$ *or* 24.75
   c. $2y+7=21$ $\quad y=7$
   d. $12-2x=-7x-1$ $\quad x=-\frac{13}{5}$ *or* $x=-2.6$

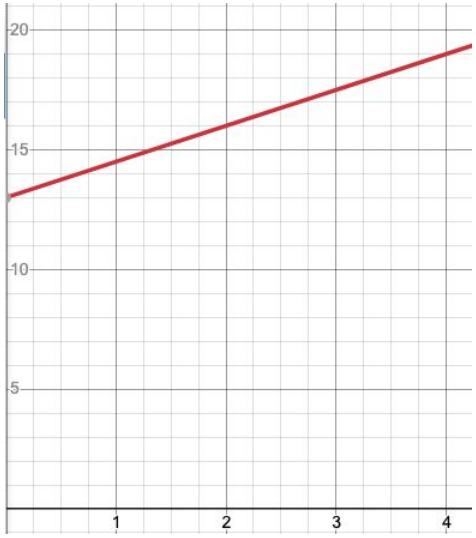
4. A student is paid 23¢ for each newspaper they deliver. Complete the table to show their earnings from delivering 25 to 100 newspapers.

Number of Newspapers	Earnings ($)
25	**5.75**
50	**11.50**
75	**17.25**
100	**23.00**

5. The following is a table that represents the relationship between cost and number of toppings on a pizza.

Number of toppings	Cost ($)
0	13.00
1	14.50
2	16.00
3	17.50

a. Describe, in words, how this pizza store determines the price of a pizza. **The store charges $13.00 for a basic pizza with no toppings, and then charges $1.50 for each topping.**
b. Graph the relation.



c. How would the table change if the cost per topping was $2? **The cost per topping is currently $1.50. If the cost was increased to $2 per topping, the line would still start at (0,13) but would be steeper than in (b).**
d. How would the graph change if the cost of a basic pizza with no toppings was $12? **The cost of a basic pizza is currently $13. If the basic pizza was to cost $12, then the line would start lower, at (0,12), and have the same steepness as in (b).**

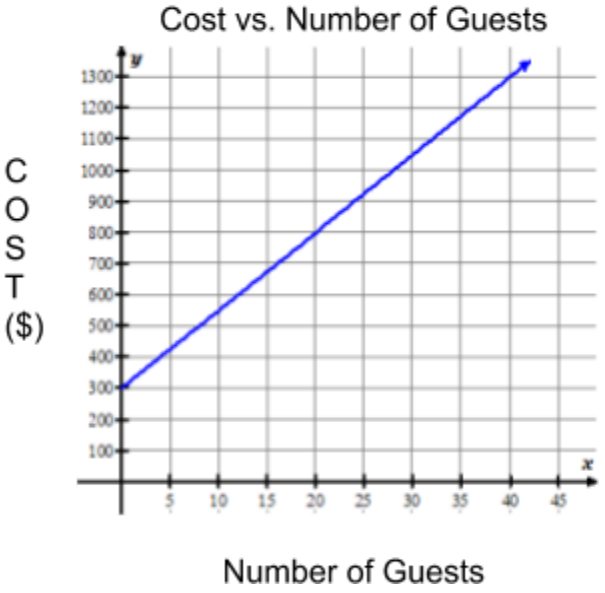
6. The graph below shows the cost of renting a banquet hall for a wedding, based on the number of guests.

a. Describe the graph. **The graph is a straight line. It starts at 300 on the vertical axis, and then rises to the right.**

b. Identify the initial value. **Initial value: $300. This is the cost to rent the hall even with no guests.**

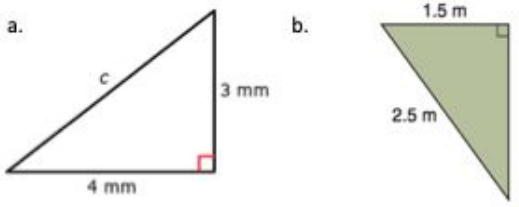
c. Identify the rate of change. **Rate of change: $40/person. (Use clear grid points such as (0,0) and (20,800), and calculate rise over run.)**

d. Write an **equation** for the linear relation, using the variable C to represent the cost and *g* to represent the number of guests.
***C* = 300 + 40*g*.**



7. The charge for renting a tour bus is $100 for the bus plus $12 for each passenger. Write an equation to determine the cost, C dollars, to rent the bus, for a trip for *p* passengers. $C = 100 + 20p$ *or* $C = 20p + 100$

8. Find the missing side length:



Use the Pythagorean Theorem.

a. **5 mm (find the length of the hypotenuse - the longest side)**
b. **2.9 m (find the length of a leg - one of the shorter sides)**

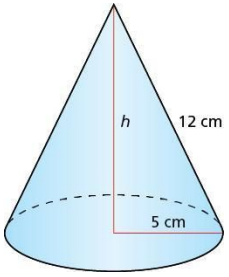
9. A can of soda has a diameter of 6 cm and a height of 13 cm. How much soda does it hold?

The can holds 368mL of soda.

$V = (Area\ of\ base) \times (Height)$ $Area\ of\ base = \pi r^2$

Since the diameter is 6cm, the radius is 3cm.
The area of the base (a circle) is 28.3cm^2.
The volume of the can is 367.6cm^3. One cm^3 holds 1 mL of liquid.

10. The diagram shows a closed cone.
a. Calculate the height.
b. Find the volume.



a. **The height is 10.9 cm (use the Pythagorean Theorem)**
b. **The volume is 285.4cm^3.**

$V = \frac{1}{3}\pi r^2 h$ **(Volume of cone formula, r is radius, h is height)**