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. $(5g+3)+(2g+4)$ c. $4xy-y^2-3x^2+2xy-x-3y^2$	 ☐ **Very comfortable**  ☐ **Somewhat comfortable**  ☐ **Not at all comfortable**	Adding and Subtracting Polynomials

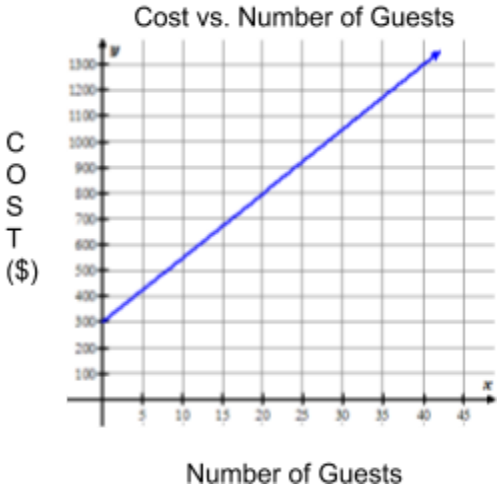
I can multiply a single term by a polynomial	2. Expand and simplify: $2x(x^2+10x-5)-3(4x+3)$	 ☐ **Very comfortable**  ☐ **Somewhat comfortable**  ☐ **Not at all comfortable**	Multiplying a Polynomial by a Monomial
I can solve equations using a variety of strategies	3. Solve for the unknown: a. $\frac{x}{-6}=3$ b. $\frac{x}{45}=\frac{11}{20}$ c. $2y+7=21$ d. $12-2x=-7x-1$	 ☐ **Very comfortable**  ☐ **Somewhat comfortable**  ☐ **Not at all comfortable**	Solving One- and Two-Step Equations Solving Multi-Step Linear Equations

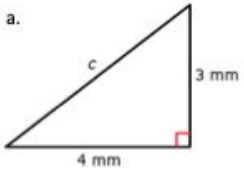
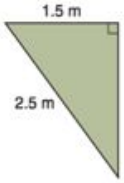
<table>
<tr>
<td>I can construct a table of values for a linear relationship</td>
<td>4. A student is paid 23¢ for each newspaper she delivers. Complete the table to show their earnings from delivering 25 to 100 newspapers.

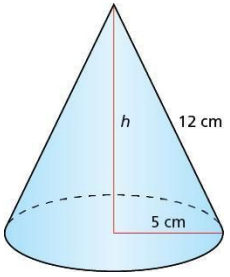
<table><tr><th>Number of Newspapers</th><th>Earnings ($)</th></tr><tr><td>25</td><td></td></tr><tr><td>50</td><td></td></tr><tr><td>75</td><td></td></tr><tr><td>100</td><td></td></tr></table></td>
<td>  ☐ Very comfortable
  ☐ Somewhat comfortable
  ☐ Not at all comfortable</td>
<td>Intro to Linear Relations Application Problem</td>
</tr>
<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></td>
<td>  ☐ Very comfortable
  ☐ Somewhat comfortable
  ☐ Not at all comfortable</td>
<td>Intro to Linear Relations Part 2</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?		
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 initial value and the rate of change	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. 	 ☐ **Very comfortable**  ☐ **Somewhat comfortable**  ☐ **Not at all comfortable**	Intro to Linear Relations Part 2 Expression Versus Equation

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: a.  b. 	 ☐ **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. $\frac{x}{-6}=3$ $x=-18$

b. $\frac{x}{45}=\frac{11}{20}$ $x=\frac{495}{20}$ *or* $\frac{99}{4}$ *or* 24.75

c. $2y+7=21$ $y=7$

d. $12-2x=-7x-1$ $x=-\frac{13}{5}$ *or* $x=-2.6$

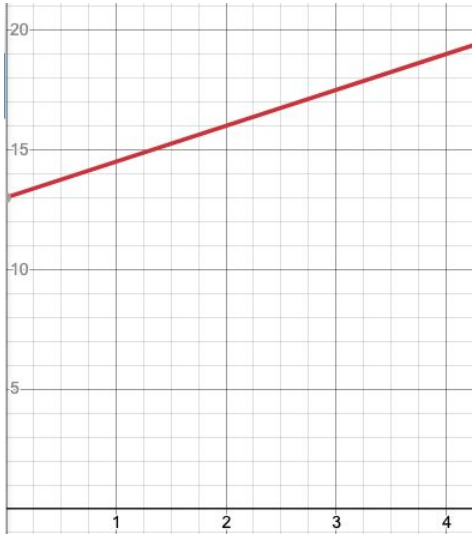
4. A student is paid 23¢ for each newspaper they deliver. Complete the table to show their earnings from delivering 25 to 100 newspapers.

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.

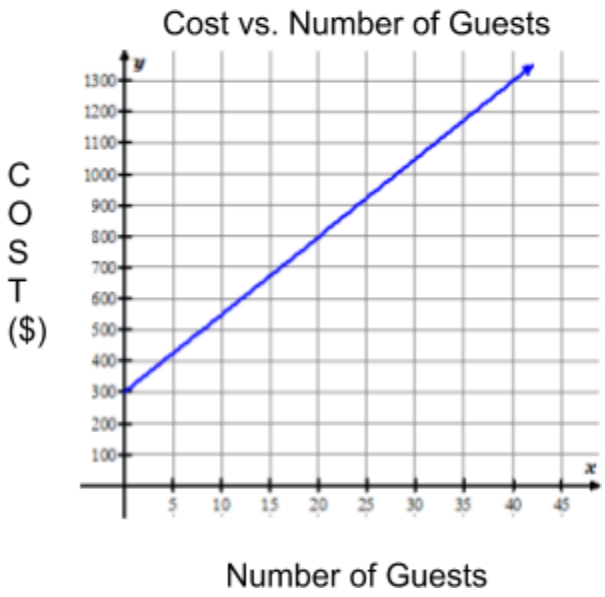
Number of toppings	Cost ($)
0	13.00
1	14.50
2	16.00
3	17.50

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.



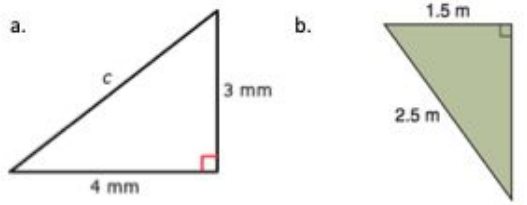
c. How would the table change if the cost per topping was $2? **The cost per topping is currently $1.50. If the cost was increased to $2 per topping, the line would still start at (0,13) but would be steeper than in (b).**
d. How would the graph change if the cost of a basic pizza with no toppings was $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. $C = 100 + 20p \quad or \quad C = 20p + 100$

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)**

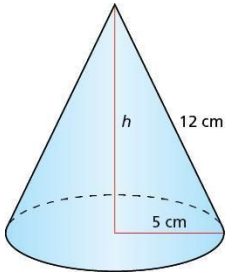
9. A can of soda has a diameter of 6 cm and a height of 13 cm. How much soda does it hold?

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)**