





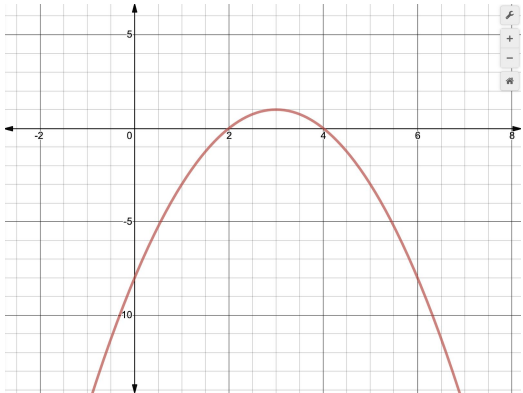

















Self-Assessment for Grade 11 University/College Math (MCF3M)

Students who are registered for Grade 11 University/College Math, Functions and Applications (MCF3M) may benefit from a self evaluation and review of the following sample of expectations from Grade10 Academic Math (MPM2D) and Grade 10 Applied Math (MFM2P).

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	Sample Question and Answer	How comfortable do you feel with this concept?	Link for further support
I can solve linear systems by graphing or by using the methods of substitution or elimination	<p>1. Solve the system of equations.</p> $4x - 5y = 12$ $6x - 10y = 24$ <p>2. Some high school students held a bake sale recently to raise money for a field trip. They charged \$7 for fruit pies and \$10 for meat pies. They sold a total of 52 pies and earned \$424. How many of each type of pie did they sell?</p>	<p>  <input type="checkbox"/> Very comfortable  <input type="checkbox"/> Somewhat comfortable  <input type="checkbox"/> Not at all comfortable </p>	<p>Solve Linear Systems</p>

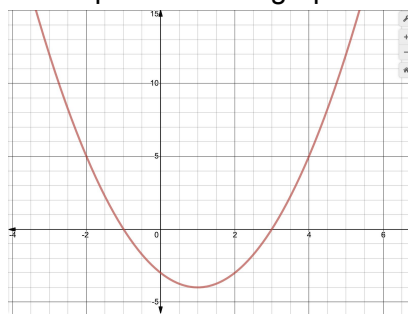
<p>I can evaluate an algebraic expression involving exponents, by substituting a value into the variable</p>	<p>3. If $x = \frac{3}{5}$ and $y = 3$, find:</p> <p>a. x^3</p> <p>b. $-y^4$</p>	<p> <input type="checkbox"/> Very comfortable</p> <p> <input type="checkbox"/> Somewhat comfortable</p> <p> <input type="checkbox"/> Not at all comfortable</p>	<p>Working with Exponents</p>
<p>I can identify the key features of a graph of a parabola and use the appropriate terminology to describe them</p>	<p>4. For the following graph, state the key features - direction of the opening; coordinates of the vertex; equation of the axis of symmetry; x and y-intercepts.</p> 	<p> <input type="checkbox"/> Very comfortable</p> <p> <input type="checkbox"/> Somewhat comfortable</p> <p> <input type="checkbox"/> Not at all comfortable</p>	<p>Key Features of a Parabola</p>

<p>I can factor polynomial expressions involving common factors, trinomials, and differences of squares</p>	<p>5. Factor the following: a) $x^2 - 14x + 49$ b) $x^2 - 16$ c) $7x^3 - 14x^2 - 14x$</p>	<p> <input type="checkbox"/> Very comfortable</p> <p> <input type="checkbox"/> Somewhat comfortable</p> <p> <input type="checkbox"/> Not at all comfortable</p>	<p>Factoring Difference of Squares and Perfect Squares</p>																								
<p>I can determine whether a relation is linear, quadratic or neither by looking at a table of values</p>	<p>6. Determine whether the graph associated with the following tables of values is linear, quadratic or neither.</p> <p>a.</p> <table border="1" data-bbox="659 716 842 971"> <thead> <tr> <th>x</th> <th> y_1</th> </tr> </thead> <tbody> <tr><td>0</td><td>-8</td></tr> <tr><td>1</td><td>-3</td></tr> <tr><td>2</td><td>0</td></tr> <tr><td>3</td><td>1</td></tr> <tr><td>4</td><td>0</td></tr> </tbody> </table> <p>b.</p> <table border="1" data-bbox="651 1045 814 1295"> <thead> <tr> <th>x</th> <th> y_1</th> </tr> </thead> <tbody> <tr><td>0</td><td>-2</td></tr> <tr><td>1</td><td>-1</td></tr> <tr><td>2</td><td>0</td></tr> <tr><td>3</td><td>1</td></tr> <tr><td>4</td><td>2</td></tr> </tbody> </table> <p>c.</p>	x	 y_1	0	-8	1	-3	2	0	3	1	4	0	x	 y_1	0	-2	1	-1	2	0	3	1	4	2	<p> <input type="checkbox"/> Very comfortable</p> <p> <input type="checkbox"/> Somewhat comfortable</p> <p> <input type="checkbox"/> Not at all comfortable</p>	<p>Comparing Linear and Quadratic Relations</p>
x	 y_1																										
0	-8																										
1	-3																										
2	0																										
3	1																										
4	0																										
x	 y_1																										
0	-2																										
1	-1																										
2	0																										
3	1																										
4	2																										

x	y_1
-2	-8
-1	-1
0	0
1	1
2	8

I can determine and describe the connection between the factors of a quadratic expression and the x-intercepts of the graph using $y = (x - r)(x - s)$.

7. Determine the equation of the graph below.



Very comfortable



Somewhat comfortable



Not at all comfortable

[Finding an Equation from a Graph](#)

I can determine the zeros (x-intercepts) of the graph of a quadratic relation

8. Determine the zeros of the graph of $y = x^2 - 10x + 24$



Very comfortable

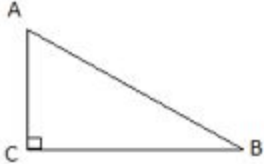








Somewhat comfortable



Not at all comfortable

[Revisiting Factored Form](#)

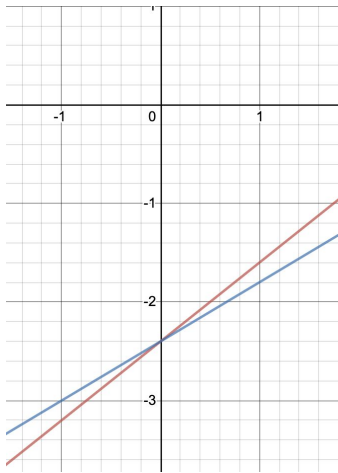
<p>I can determine the measures of the sides and angles in right triangles using the primary trigonometric ratios</p>	<p>9. Determine the measures of side AB and angle A, if the length of side AC is 5 and side CB is 12.</p> 	<p> <input type="checkbox"/> Very comfortable</p> <p> <input type="checkbox"/> Somewhat comfortable</p> <p> <input type="checkbox"/> Not at all comfortable</p>	<p>Sine and Cosine Sine and Cosine Ratios</p> <p>Tangent Applications of the Tangent Ratio</p> <p>Pythagorean Theorem The Pythagorean Theorem</p>
<p>I can solve problems involving the measures of sides and angles in right triangles in real-life applications.</p>	<p>10. A surveyor is 40m from the edge of a building. The angle of elevation from the surveyor to the top of the building is 55°. What is the height of the building?</p>	<p> <input type="checkbox"/> Very comfortable</p> <p> <input type="checkbox"/> Somewhat comfortable</p> <p> <input type="checkbox"/> Not at all comfortable</p>	<p>Applications of Sine and Cosine Applications of Sine and Cosine</p> <p>Applications of Tangent Applications of the Tangent Ratio</p>

Solutions to Sample Questions:

1. Solve the system of equations.

$$4x - 5y = 12$$

$$6x - 10y = 24$$



P.O.I at (0, -2.4)

2. Some students at NHS held a bake sale recently to raise money for a field trip. They charged \$7 for fruit pies and \$10 for meat pies. They sold a total of 52 pies and earned \$424. How many of each type of pie did they sell?

Let F represent the number of Fruit Pies sold.

Let M represent the number of Meat Pies sold.

$$7F + 10M = 424 \quad (1)$$

$$F + M = 52 \quad (2)$$

Solve (2) for F: $F = 52 - M$

Sub this into (1)

$$7(52 - M) + 10M = 424$$

$$364 - 7M + 10M = 424$$

$$3M = 60$$

$$M = 20$$

Sub $M = 20$ into (2): $F + 20 = 52 \rightarrow F = 32$

Therefore they sold 32 Fruit pies and 20 Meat pies

3. If $x = \frac{3}{5}$ and $y = 3$, find:

a. $x^3 = \left(\frac{3}{5}\right)^3 = \frac{27}{125}$

b. $-y^4 = -(3)^4 = -(81) = -81$

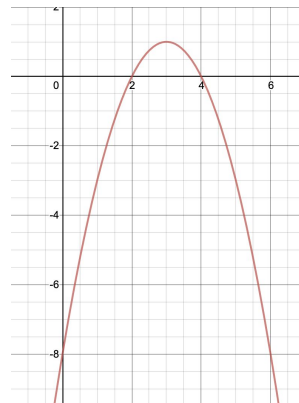
4. For the following graph, state the key features -

a. direction of the opening; **Down**

b. coordinates of the vertex; **(3,1)**

c. equation of the axis of symmetry; **x = 3**

d. x and y-intercepts. **y-int: (2, 0), (4, 0) x-int: (0, -8)**



5. Factor the following:

a. $x^2 - 14x + 49$ **Add: -14 Mult: 49 two values that fit this process are: -7, -7**

$$x^2 - 14x + 49 = (x - 7)(x - 7) = (x - 7)^2$$

b. $x^2 - 16$ **Difference of 2 squares:** $(x - 4)(x + 4)$

c. $7x^3 - 14x^2 - 14x$ **GCF first:** $7x(x^2 - 2x - 2)$ **Remaining trinomial is unfactorable (but need to check...)**

6. Determine whether the graph associated with the following tables of values is linear, quadratic or neither.

a.

x	y_1
0	-8
1	-3
2	0
3	1
4	0

Quadratic

b.

x	y_1
0	-2
1	-1
2	0
3	1
4	2

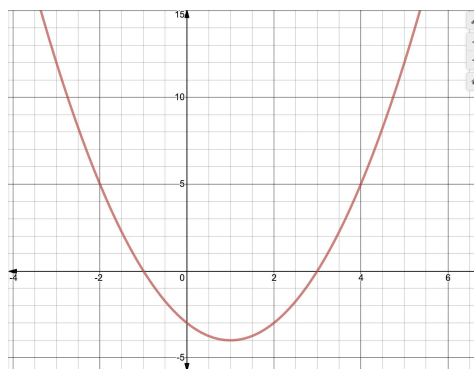
Linear

c.

x	y_1
-2	-8
-1	-1
0	0
1	1
2	8

neither linear nor quadratic

7. Determine the equation of the graph below.



$$y = (x - 1)^2 - 4$$

8. Determine the zeros and the max/min value of $y = x^2 - 10x + 24$

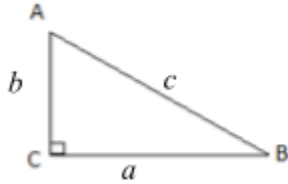
For zeros: Factor $(x - 6)(x - 4) \rightarrow x = 6$ **or** $x = 4$

For max/min value: since it opens up \rightarrow it is a minimum value

It occurs on the axis of symmetry: $x = 5$.

Min value will occur at $x = 5$. $y = 5^2 - 10(5) + 24 = 25 - 50 + 24 = -49$

9. Determine the measures of side AB and angle A, if the length of AC is 5 and CB is 12.



$$\tan A = \frac{12}{5} \rightarrow A = \tan^{-1} \frac{12}{5} = 67.4^\circ$$

$$AB^2 = 5^2 + 12^2 = 25 + 144 = 169$$
$$AB = 13$$

Or

$$\sin 67.4 = \frac{12}{AB} \rightarrow AB = \frac{12}{\sin 67.4} \rightarrow AB = 13$$

10. A surveyor is 40m from the edge of a building. The angle of elevation from the surveyor to the top of the building is 55° . What is the height of the building?

$$\tan 55 = \frac{\text{height}}{40}$$

$$\text{Height} = 40 \tan 55 = 57.13$$