

MCF3M

Ontario Educational Resources Bank (OERB) Activities

Quadratic Functions

Activity

Description

Completing the Square

Complete the Square

Re-arrange the tiles to form a square. What must be added to complete the square in each case?

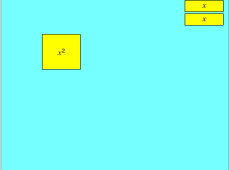
To rotate a rectangular block, double-click it.

Click one of the letters below to bring up the tiles:

A) $x^2 + 2x + ?$
 B) $x^2 + 4x + ?$
 C) $x^2 + 6x + ?$
 D) $x^2 + 8x + ?$

Click here for unit squares to add.

Unit Square



Record your results:

A) $x^2 + 2x + \square$
 $= (x + \square)(x + \square)$
 B) $x^2 + 4x + \square$
 $= (x + \square)(x + \square)$
 C) $x^2 + 6x + \square$
 $= (x + \square)(x + \square)$
 D) $x^2 + 8x + \square$
 $= (x + \square)(x + \square)$

By this pattern, what is the missing term in $x^2 + 16x + ?$

Hint

Resource ID: ELO1084080

Build understanding of perfect square trinomials and a foundation for the process of completing the square by determining the missing tiles needed to complete images of perfect squares using virtual algebra tiles.

The Function Machine

The Function Machine

Table

Determine the next two values for the range.

$g(\square) =$

D	R
3	0

D	R
0	0
1	0
2	0
3	0
4	
5	

Submit

Click the menu button for another function representation. Menu

Resource ID: ELO1079500

Build understanding of how the range values depend on the domain values for a function by exploring tables of values, data sets, mapping diagrams and graphs, and predicting equations for each relation described.

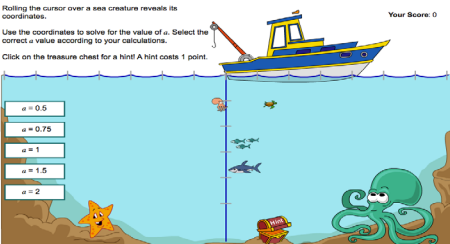
Go Fish

Rolling the cursor over a sea creature reveals its coordinates.

Your Score: 0

Use the coordinates to solve for the value of a . Select the correct a value according to your calculations.

Click on the treasure chest for a hint! A hint costs 1 point.



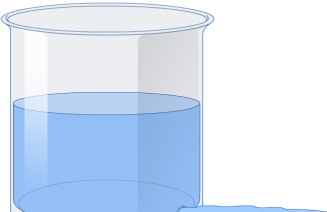
$a = 0.5$
 $a = 0.75$
 $a = 1$
 $a = 1.5$
 $a = 2$

Resource ID: EL01195080

Practise determining the stretch or compression factor given the vertex and one other point by finding the value of a , and ultimately the equation of a quadratic in vertex form, after viewing some model solutions.

Leak

Leak



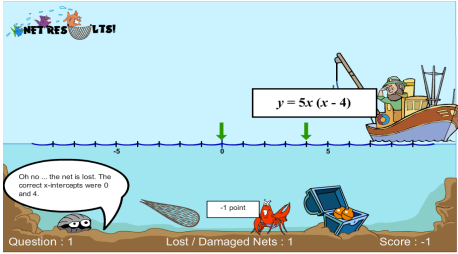
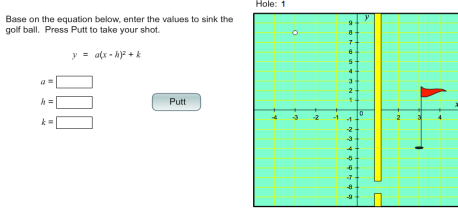
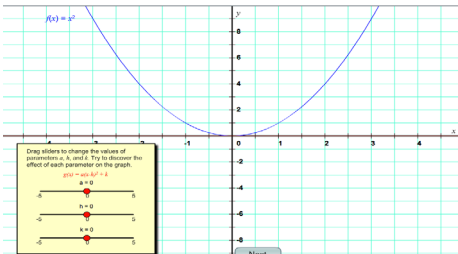
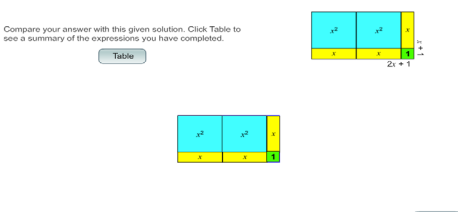
Time (minutes)	Volume (litres)
0	1200
1	1083
2	972
3	867
4	768

Resource ID: ELO1079520

Build understanding of the properties of quadratic functions by exploring a water leaking simulation where data is collected and represented graphically. Practise applying this knowledge by completing a quiz.

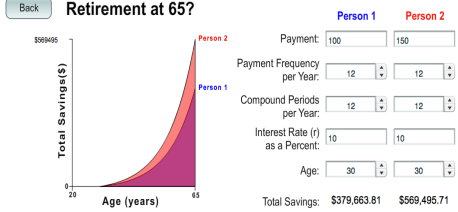
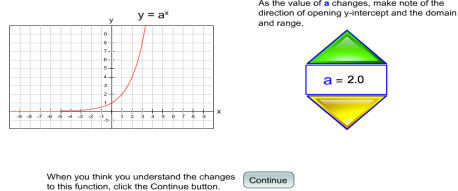
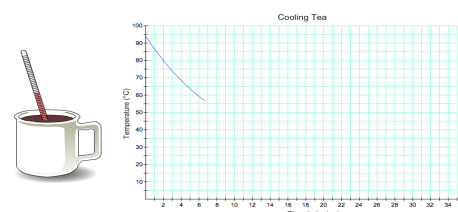
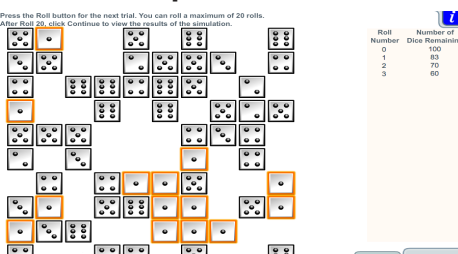
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Ontario Educational Resources Bank (OERB) Activities

Quadratic Functions (continued)	
Activity	Description
<p style="text-align: center;">Net Results</p>  <p style="text-align: center;">Resource ID: ELO1196410</p>	<p>Build understanding of how to determine the x-intercepts given a quadratic in factored form by viewing a scripted tutorial. Practise determining the x-intercepts of a quadratic in factored form by dragging buoys to the appropriate x-intercepts on a number line in a fishing activity.</p>
<p style="text-align: center;">Quadratic Mini-Golf</p> <p style="text-align: center;">Quadratic Mini-Golf Game</p>  <p style="text-align: center;">Resource ID: ELO1099580</p>	<p>Practise determining the equation of a quadratic in vertex form $y=a(x-h)^2+k$, by calculating a when given the vertex and another point in a golf simulation activity.</p>
<p style="text-align: center;">Quadratic Transformations</p>  <p style="text-align: center;">Resource ID: ELO1079540</p>	<p>Build understanding of transformations by exploring the effects of each parameter in the quadratic equation $y=a(x-h)^2+k$. Practise applying this knowledge by completing a quiz.</p>
<p style="text-align: center;">Rectangle Factory</p> <p style="text-align: center;">Rectangle Factory</p>  <p style="text-align: center;">Resource ID: ELO1098970</p>	<p>Build understanding of factoring by creating rectangles with a given area, using virtual algebra tiles.</p>




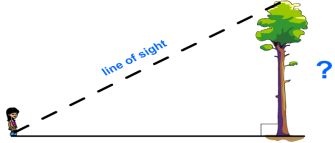
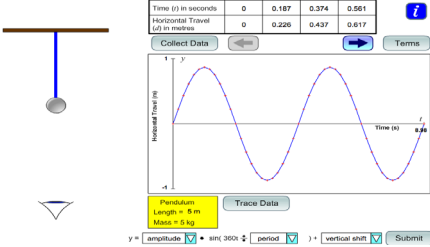
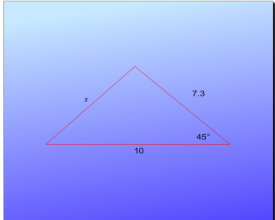
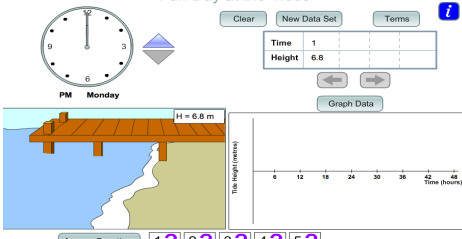
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Ontario Educational Resources Bank (OERB) Activities

Exponential Functions	
Activity	Description
<div style="text-align: center;"> <h3>Annuities at Work</h3> <p>Retirement at 65?</p>  <p>Resource ID: ELO1088020</p> </div>	<p>Build understanding of factors affecting annuities and loans by exploring the impact of changes to interest rates, payments, payment periods, and compounding periods.</p>
<div style="text-align: center;"> <h3>Exploring Exponential Functions</h3> <p>Exploring Exponential Functions</p>  <p>Resource ID: ELO1079540</p> </div>	<p>Build understanding of the properties of the basic exponential function $y=a^x$ by exploring what happens to a graph as the value of the base a changes. Practise applying this knowledge by completing a quiz.</p>
<div style="text-align: center;"> <h3>Just Chillin'</h3> <p>Just Chillin'</p>  <p>Resource ID: ELO1194980</p> </div>	<p>Build understanding of exponential decay by investigating and interpreting the parts of a graph related to a simulation of hot liquid cooling.</p>
<div style="text-align: center;"> <h3>Keep on Rollin</h3>  <p>Resource ID: ELO1087820</p> </div>	<p>Build understanding of exponential decay by investigating and interpreting the parts of a graph related to a dice rolling simulation.</p>

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Ontario Educational Resources Bank (OERB) Activities

Trigonometric Functions	
Activity	Description
<p style="text-align: center;">The Great Trig Trek</p> <p style="text-align: center;">The Great Trig Trek North America</p> <p>You must calculate the height of a giant redwood tree in California. Select a tool and then click on the part of the diagram you wish to measure. Some measurements may not be available. You may ignore the height of the team member in the calculations.</p> <div style="display: flex; align-items: center;"> <div style="margin-right: 20px;">    </div>  </div> <p style="text-align: center;">Resource ID: ELO1194980</p>	<p>Practise selecting an appropriate tool by deciding whether a trig ratio, the sine law or the cosine law should be used to solve for a missing measure in a triangle. Practise problem solving by calculating the measure of a missing side or angle in real-life examples involving triangles.</p>
<p style="text-align: center;">Pendulum Investigation</p>  <p style="text-align: center;">Resource ID: ELO1081410</p>	<p>Build understanding of the characteristics of the sine function by investigating the data collected and the graphs created from a simulation of the periodic behaviour of a pendulum swinging.</p>
<p style="text-align: center;">Sine Law vs. Cosine Law</p> <p style="text-align: center;">Sine Law vs. Cosine Law</p>  <p style="text-align: center;">Select the law that will solve for the unknown based on the given information.</p> <div style="display: flex; justify-content: center; gap: 20px;"> <input type="button" value="Sine Law"/> <input type="button" value="Cosine Law"/> </div> <p style="text-align: center;">Resource ID: ELO1090620</p>	<p>Practise the sine law and cosine law by selecting the appropriate law and solving for a missing measure in a triangle.</p>
<p style="text-align: center;">Sinusoidal Tides</p> <p style="text-align: center;">Fun Day at the Tides</p>  <p style="text-align: center;">Resource ID: ELO1081390</p>	<p>Build understanding of the characteristics of the sine function by investigating the data collected and the graphs created from a simulation of the periodic behaviour of tides.</p>

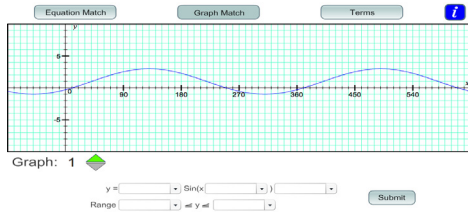
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Ontario Educational Resources Bank (OERB) Activities

Trigonometric Functions (continued)

Activity

Description

Transformations Exploration



Build understanding of the sine function by investigating and interpreting the key features of graphs and equations of the form $y = a \sin(x - d) + c$.

Resource ID: ELO1084100