

MCV4U

Ontario Educational Resources Bank (OERB) Activities

Derivatives and Their Applications

Activity

Description

Computing Derivatives

Computing Derivatives

Click on a button to select the type of question you want. Choose **Practise All** for a random selection of all types of problems.

Derivative Rule	Function	Derivative	Practise All
Constant	$f(x) = a$	$f'(x) = 0$	Practise
Power	$f(x) = x^n$	$f'(x) = nx^{n-1}$	
Sum	$f(x) = g(x) + h(x)$	$f'(x) = g'(x) + h'(x)$	Practise
Difference	$f(x) = g(x) - h(x)$	$f'(x) = g'(x) - h'(x)$	
Product	$f(x) = g(x)h(x)$	$f'(x) = g'(x)h(x) + g(x)h'(x)$	Practise
Quotient	$f(x) = \frac{g(x)}{h(x)}$	$f'(x) = \frac{g'(x)h(x) - g(x)h'(x)}{[h(x)]^2}$	
Chain	$f(x) = g(h(x))$	$f'(x) = g'(h(x))h'(x)$	Practise
Trigonometric	$f(x) = \sin(x)$ $g(x) = \cos(x)$	$f'(x) = \cos(x)$ $g'(x) = -\sin(x)$	Practise
Exponential	$f(x) = e^x$	$f'(x) = e^x$	

Resource ID: ELO1090660

Practise computing derivatives by completing a set of multiple choice questions dealing with the derivative rules applied to polynomial, trigonometric, and exponential functions.

Identifying Derivatives

Identifying Derivatives Investigation

Choose the type of function.

Quadratic
 Cubic
 Quartic

$x = 0$
 $y = 0.25$
 Slope = 0

Slide the point to move the tangent line. Click the "Plot Point" button to plot a point at the current x value of the slope of the tangent as the y value.

Plot Point

Quiz

Resource ID: ELO1081450

Build understanding of the derivative function for polynomials by using an applet that generates graphs from the slope values at various points while sliding along the curve. Practise connecting the graph of a polynomial to the graph of its derivative function by completing a matching quiz.

Geometry and Algebra of Vectors

Activity

Description

Adding Vector's Vectors

Sometimes we may want to determine the component vectors. That is, determine what vectors were added together to arrive at the resultant vector.

Example! Victor must push a wheelbarrow up a ramp that is at an angle of 15° above horizontal. If it takes a force of 200 N to push the loaded wheelbarrow up the ramp what are the vertical or horizontal components of this force?

In other words, what is the upward force and what is the horizontal force.

Audio

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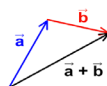
Next

Resource ID: ELO1178320

Build understanding of vector addition by viewing an interactive tutorial showing a number of worked examples of real-life applications. Practise applying this knowledge by solving similar vector addition problems.

Vector Addition

Adding Vectors



If we wanted to find the sum of the two vectors here, $\mathbf{a} + \mathbf{b}$, geometrically, what we do is slide vector \mathbf{b} over so that its tail is at the tip of vector \mathbf{a} . The geometric sum of the two vectors, here shown in black, goes from the tail of vector \mathbf{a} directly to the tip of vector \mathbf{b} .

Previous

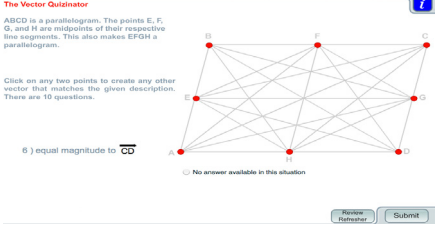
Restart

Continue

Resource ID: ELO1197530

Practise adding two vectors by dragging given vectors into position to show the component vectors and the resultant vector properly aligned.

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Geometry and Algebra of Vectors (continued)	
Activity	Description
<p style="text-align: center;">Vector Connector</p>  <p style="text-align: center;">Resource ID: ELO1080050</p>	<p>Practise identifying equivalent, parallel and equal magnitude vectors by completing an interactive quiz after an interactive review of these topics.</p>