

**302-RF1 Rational Expressions** Determine equivalent forms of rational expressions (limited to numerators and denominators that are monomials and binomials)

I can explain why a given value is non-permissible for a rational expression

1) Explain what a non-permissible value is

2) Explain how you find the non-permissible values of an equation.

$$\frac{3x^2 - 8x}{2x}$$

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I can determine a non-permissible values for the rational expression.

1) Determine the non-permissible values for the following expressions

a)  $\frac{15x^2yz^3}{20xyz}$

b)  $\frac{x^2 + 6x + 8}{x^2 - 4}$

c)  $\frac{2x^2 - 7xy + 6y^2}{x^4 - 16y^4}$

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I can write equivalent forms of a rational expressions.

1) Simplify the following expressions

a)  $\frac{15x^2yz^3}{20xyz}$

b)  $\frac{x^2 + 2x}{x^2 - 4}$

c)  $\frac{x^2 - 4y^2}{x^4 - 16y^4}$

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**302-RF2 Operations on Rational Expressions** - Perform operations on rational expressions (limited to numerators and denominators that are monomials and binomials)

I can determine non-permissible values of rational expressions.

I can determine the sum or difference of rational expressions.

I can simplify a rational expression.

1) Determine the non-permissible values , find the sum or difference and simplify the following expressions.

a)  $\frac{3x}{4} + \frac{x}{5} - \frac{7x}{10}$

b)  $\frac{x - 9}{2x} + \frac{3x}{x - 4}$

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$$\text{c) } \frac{4}{5x+5} + \frac{3}{2x+2}$$

$$\text{d) } \frac{(x-2)(x-1)}{(x-4)(x-1)} - \frac{(x+6)(x+4)}{(x+2)(x+6)}$$

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I can determine non-permissible values of rational expressions.

I can determine the product or quotient of rational expressions.

I can simplify a rational expression.

$$\text{a) } \frac{12xy}{4z} \times \frac{3xz^2}{y}$$

$$\frac{(x+1)}{(x-2)(x+3)} \times \frac{2x+6}{x^2+x}$$

$$\text{c) } \left( \frac{(x+5)(x+3)}{(2x+1)(x+3)} \right) \left( \frac{-4x^2+x}{(2x-1)(x+5)} \right)$$

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d) 
$$\frac{4x^2 - 12x}{x^2 - 9} \div \frac{7x^3 + 7x^2}{x^2 + 4x + 3}$$

e) 
$$\frac{\frac{4x + 12}{3x + 12}}{\frac{3x^2 + 9x}{(x + 4)^2}}$$

May 21-10:10 AM

**2302-RF3 Rational Equations** - Solve problems that involve rational equations (limited to numerators and denominators that are monomials and binomials)

I can determine the non-permissible values of a rational equation.

I can determine the solution to a rational equation algebraically.

a) 
$$x + \frac{2}{x} = 3$$

b) 
$$\frac{4x - 2}{2x + 3} = \frac{6x - 1}{3x + 5}$$

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$$\text{c) } \frac{8x + 10}{x - 3} - 4 = \frac{10x + 4}{x - 3} \qquad \text{d) } \frac{x - 1}{x + 1} = \frac{2x}{15}$$

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I can determine the non-permissible values of a rational equation.

I can determine the solution to a rational equation algebraically.

I can explain why some solutions of a rational equation may actually be extraneous.

$$\text{a) } \frac{x^2 - 5x - 6}{x + 1} = 2$$

$$\text{b) } \frac{4x + 3}{2x - 1} - 2 = \frac{6x + 2}{2x - 1}$$

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I can determine the non-permissible values of a rational equation.  
 I can determine the solution to a rational equation algebraically.  
 I can solve problems using rational equations

a) Competing in an endurance race, Shannon cycled for 120 km, then swam for 12 km. Her average cycling speed was eight times faster than her swimming speed. Shannon took 9 hours to complete the race. Calculate her average swimming speed.

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**302 - RF8 Sinusoidal Functions** - Represent data, using sinusoidal functions, to solve problems.

	Definition	How do you find on a graph?	How do you find from an equation?
Period			
Amplitude			
Horizontal Phase shift			
Vertical Displacement			

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I can sketch the graph of  $y = a \sin(bx - c) + d$

1) Sketch the graphs of the following sinusoidal functions.

a)  $y = -2 \sin(3x - 2) + 1$

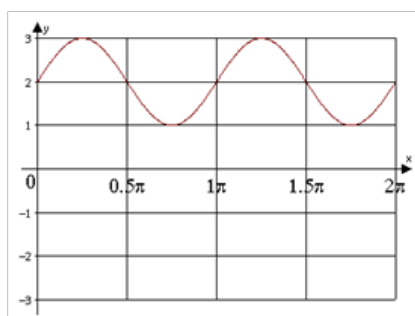
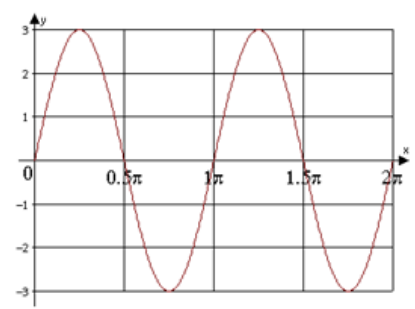
b)  $y = 0.5 \sin(x + 3) - 2$

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I can determine the amplitude of a trigonometric graph.

I can determine the period of a trigonometric graph.

1) Determine the period and amplitude of the following graphs.

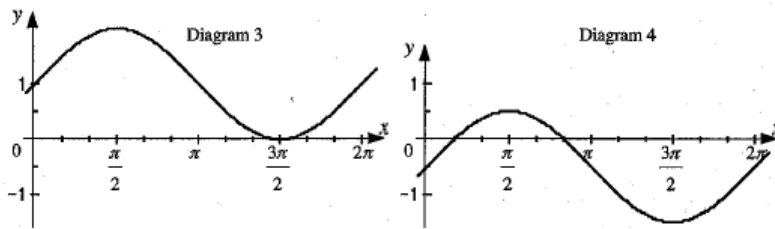


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I can determine the horizontal (phase) shift.

I can determine the vertical displacement.

1) Determine the horizontal and vertical shifts of the following graphs.



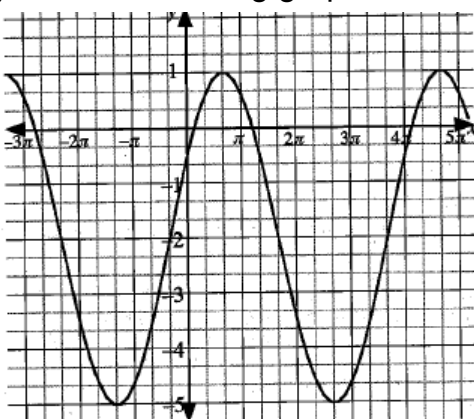
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I can determine the maximums and minimums of a trigonometric function.

I can determine the domain and range of a trigonometric graph.

I can determine the zeros of a trigonometric graph.

1) Use the following graph to fill in the table



Period	
Amplitude	
Vertical displacement	
Horizontal Phase Shift	
Maximums	
Minimums	
Domain	
Range	
Zeros	

2) Determine the equation that would represent the graph above.

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I can write a trigonometric equation to solve a problem.

1) The Ferris Wheel below can be described mathematically by the sinusoidal function  $h = a \sin(bt + c) + d$ , where  $h$  is the chair's height in feet and  $t$  is the time in seconds.

a) What is the amplitude of the function?

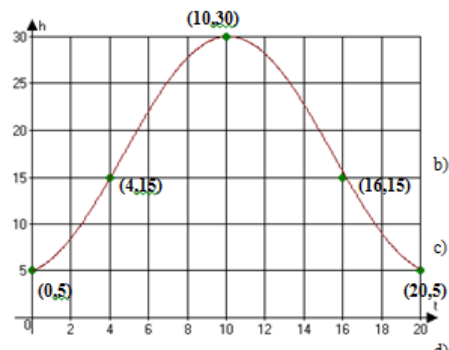
b) What is the vertical displacement of the function?

c) What is the period of the function.

d) What is the horizontal phase shift of the function?

e) Write an equation that represents the path of the Ferris Wheel.

f) Determine the height of the Ferris wheel at 6 seconds.



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I can use a trigonometric equation to solve a problem.

1) Use a regression to determine an equation for the following data.

a) Predict the position of the pendulum after 1 second and 2 seconds.

Time	Position	Time	Position
0.05	0.9258	0.50	1.2036
0.10	0.6625	0.55	1.2647
0.15	0.7582	0.60	0.9245
0.20	1.1258	0.65	0.8026
0.25	1.2571	0.70	0.6845
0.30	0.9957	0.75	0.9324
0.35	0.8652	0.80	1.2587
0.40	0.6875	0.85	1.2254
0.45	0.8458	0.90	0.8678

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2) The function  $y = 3000 \sin (\pi/6 x) + 55000$  describes the rabbit population in Jasper each year.

a) What is the amplitude of the function?

b) What value would you add to 3000 to determine the maximum value?

c) Calculate the value of the rabbit population after the 6th month.

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