

Mastery Quiz 3

January Calendar Math Blue

Area and Volume

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Homework 6.3 Questions...

⑥  $4x^2 < 9$   
 $4x - 9 < 0$   
 $x = -1.5 \quad x = 1.5$

$4x^2 - 9 < 0$   
less

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$y^2 - 8y + 16 > 0$   
 $y = 4$

$(-\infty, 4) \cup (4, \infty)$

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⑬  $x^2 - 7x + 15 = 0$   
 $a = 1 \quad b = -7 \quad c = 15$   
 $y = a(x-h)^2 + k$

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Shape	Picture	Area	Volume
Cylinder		$B = \pi r^2$ base circle	$V = Bh$ $V = \pi r^2 h$
Sphere		$20\pi$	$V = \frac{4}{3}\pi r^3$ $V = \frac{4}{3}\pi(2.1)^3$ $62.83 \text{ in}^3$
Cone		$A = \pi r^2$ Base	$V = \frac{1}{3}Bh$ $V = \frac{1}{3}\pi r^2 h$ $V = \frac{1}{3}\pi(2.7)^2 \cdot 4.9$ $37.41 \text{ units}^3$

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6.4 Rational Inequalities

Anytime you have an x in the denominator you cannot use an x-value that will make it 0.

The value that will make the denominator 0 is a vertical asymptote.

You CANNOT touch an asymptote. It must be an open circle (Parenthesis)

What is the vertical asymptote?

$\frac{1}{x-3}$

$x-3=0 \quad x \neq 3$   
 $+3 \quad +3$   
 $x=3$

$\frac{1}{0}$

Remember to set the bottom equal to zero.

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Steps to Solving Rational Inequalities

Step 1: Set the bottom equal to zero get the vertical asymptote.

Set the top equal to zero to get the x-intercept.

Step 2: Make a sign chart- test points to determine if the graph is positive or negative

Step 3: Determine if the answer is positives or negatives.

Step 4: Write the answer in interval notation from left to right.

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Bracket: Closed Circle, top only  
 $\leq, \geq$

Parenthesis: Open Circle, always bottom  
 $<, >$

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Example:  $\frac{1}{x-5} > 0$  *greater*

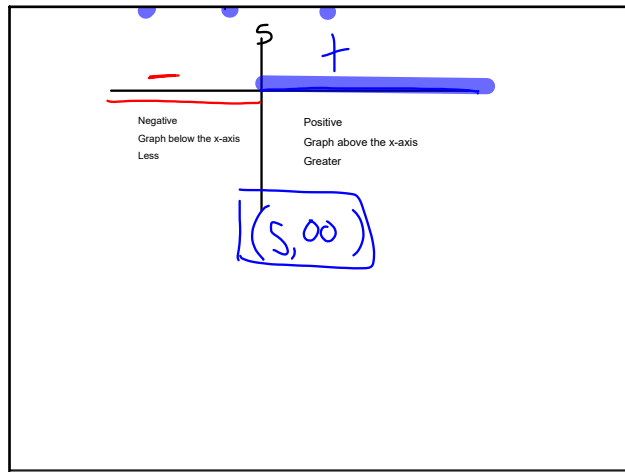
Step 1:  $x-5=0$   
 Bottom  
 $x=5$   
 $(x \neq 5)$

Step 2:  $\begin{array}{c} - \quad 5 \quad + \\ \leftarrow \quad \quad \rightarrow \\ \text{y value is negative} \quad \text{y value is positive} \\ x=3 \quad \quad \quad x=6 \end{array}$

Step 3: *greater*

Step 4:

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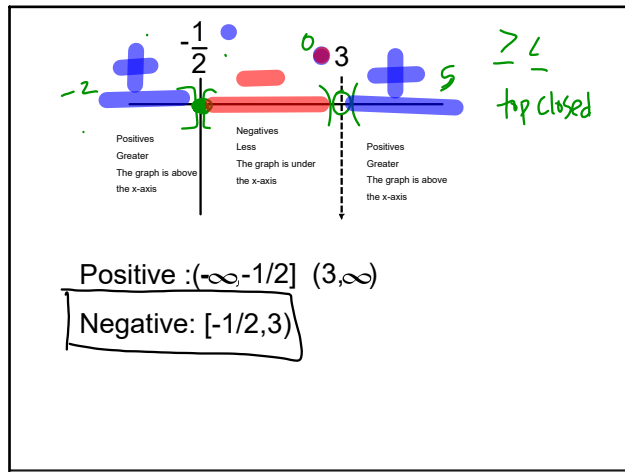
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Example 2:  $\frac{2x+1}{x-3} < 0$   $\leq$  less neg

1.  $2x+1=0$   
 $-1 -1$   
 $\frac{2x}{2} = \frac{-1}{2}$   
 $x = -\frac{1}{2}$   
 bracket

$x-3=0$   
 $+3 +3$   
 $x \neq 3$   
 parenthesis

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Polynomials

- find x-intercepts
- sign chart

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$$\textcircled{14} \quad 2x^3 + 7x^2 - 77x - 40 > 0$$

$$x = 8 \quad x = -.5 \quad x = 5$$

$$\left( \begin{array}{c} -8 \quad -5 \quad 5 \\ \leftarrow \quad \leftarrow \quad \leftarrow \\ \left( \begin{array}{c} x \\ + \end{array} \right) \left( \begin{array}{c} x \\ - \end{array} \right) \left( \begin{array}{c} x \\ + \end{array} \right) \end{array} \right)$$

$$\boxed{(-8, -.5) \cup (5, \infty)}$$

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Vertex:  $y = a(x-h)^2 + k$  4.34.4

Intercept:  $y = a(x-p)(x-q)$

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