

Rational Functions (9.1) p442 day 1

take up quiz 12

Quiz 12C

1. Solve  $\frac{1}{x} + 2 = 3$

2. Solve  $3^{x+1} = 12$

3. A colony of streptococcus bacteria grows from 200 to 2400 in 3 hours. Find the doubling period.

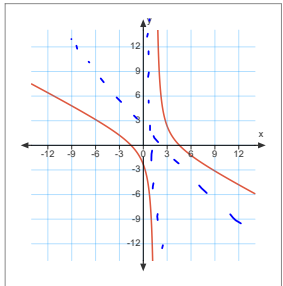
4. Prove:  $\sin^2 \theta + \cos^2 \theta = 1$

5. The height of the tide in the harbor is modeled by  $h(t) = 2 \sin \left( \frac{\pi}{6} t \right) + 5$  where  $t$  is the depth in feet and  $h$  is the time in hours. If  $t=0$  is midnight, find the height of the water at 8 am.

6. Find all the intercepts and sketch  $y = -2x^2 + 6x + 2$

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ex1: Sketch a graph of  $y = \frac{x^2 - 3x - 7}{3 - 2x}$



how do we know what it looks like?

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ex2: Sketch the graph of  $y = \frac{1}{x}$

$f(x) = \frac{2}{x} + 3$  vert trans 3 vert str. 2

$g(x) = \frac{1}{x-4} - 1$  down 1 right 4

$h(x) = \frac{-2}{x+3} + 4$  up 4 left 3 str. 2 v ref.

$y = \frac{a}{x-h} + k$  is a **rational function**. It is a fraction of polynomials

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$y = \frac{1}{x}$  is an **odd function**

$y = \frac{1}{-x}$  h ref

$y = -\frac{1}{x}$  v ref.

a horizontal reflection looks like a vertical reflection

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ex3: Sketch a graph for  $y = \frac{4x-5}{x-2}$  395 98

V.a.  $x=2$  y-int x-int

h.a.  $y = \frac{4x}{x} = 4$  x=0 y=0

$y = \frac{4x-5}{x-2}$  y = 0 4x-5=0 x = 5/4

the key is finding the vertical and horizontal asymptotes, then the intercepts 4ac

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ex4: Sketch  $y = \frac{3}{(x-4)^2}$

7ac

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hw: p442 #4ac, 7ac, 12

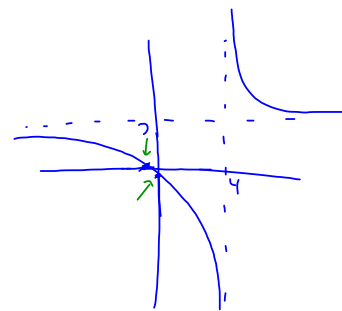
4a)  $y = \frac{2x+1}{x-4}$

v.as.  $x-4=0$   
 $x=4$

h.as.  $y = \frac{2x}{x} = 2$

y.int  $y = \frac{1}{-4}$

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



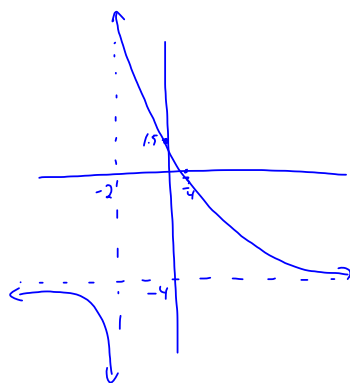
4c)  $y = \frac{-4x+3}{x+2}$

v.as  $x = -2$

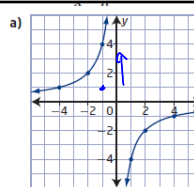
h.as  $y = -4$

y.int  $\frac{3}{2}$

x.int  $-4x+3=0$   
 $x = \frac{3}{4}$



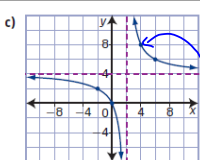
7a)



v str. 4  
v refl.

$y = -\frac{4}{x}$

7c)



h trans 2 →  
v trans 4 ↑  
over 2 up 4  
should be over 2 up  $\frac{1}{2}$   
∴ stretch of 8

$y = \frac{1}{x}$

$y = \frac{8}{x-2} + 4$

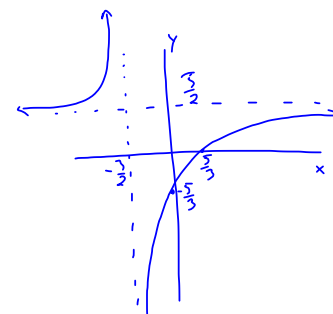
12.  $y = \frac{3x-5}{2x+3}$

v.as  $2x+3=0$   
 $x = -\frac{3}{2}$

h.as  $y = \frac{3x}{2x} = \frac{3}{2}$

y.int  $-\frac{5}{3}$

x.int  $3x-5=0$   
 $x = \frac{5}{3}$



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protein folding