

Use the solutions to check your HW $\xrightarrow{\text{then}}$ let me know if you have questions

😊

then

The next test is
Friday, Nov 2

Then do the Warm Up.

ator

① $\frac{13}{50} \cdot \frac{707}{62} = \frac{(3)(7)(7)}{50(6)}$ $\left(\frac{7}{10}\right)$

② $\frac{3}{5} \div \frac{27}{20} = \frac{13}{15} \cdot \frac{264}{219} = \left(\frac{4}{9}\right)$

③ $\frac{-9n^3}{6n^1} = \left(-\frac{3n^2}{2}\right)$

$$\textcircled{4} \quad \frac{n^4 + n}{n} = \frac{\cancel{n}(n^3 + 1)}{\cancel{n}} = n^3 + 1$$

$$\textcircled{5} \quad \frac{4x - 10}{6x} = \frac{\cancel{2}(2x - 5)}{3\cancel{2}x} = \boxed{\frac{2x - 5}{3x}}$$

$$\textcircled{6} \quad \frac{\cancel{39}(n+1)\cancel{(n+1)}}{\cancel{515}(n+1)} = \frac{\cancel{3}(n+1)\cancel{(n+1)}}{\cancel{5}(n+1)} = \boxed{\frac{3(n+1)}{5}}$$

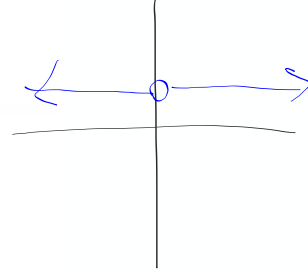
with your calculator

$$\text{divide } \frac{52}{0} = \text{undefined}$$

wait for instructions

(A)

$$\frac{16x}{16x} = 1$$



now graph $y = \frac{16x}{16x}$

$$\therefore \frac{16x}{16x} = 1 \text{ except } x \neq 0$$

(B)

$$\frac{x-3}{x-3} = 1 \text{ except } x \neq 3$$

HW Questions

67f $(m^2)^{\frac{-3}{2}}$ = m^{-3} = $\frac{1}{m^3}$

$2 \cdot \frac{2}{3}$

$$(a^2)^3 = a^6$$

$$(a^n)^m = a^{mn}$$

63

① ② ③ ④ ⑤

 1, 3, 5, 7, 9, ...

$$t(n) = 1 + 2(n-1) \quad \leftarrow n^{\text{th}} \text{ term}$$

$$t(46) = 1 + 2(46-1) = 91 \quad \leftarrow 46^{\text{th}} \text{ term}$$

64

First piece of metal $T_1 = 20 + 2x$
 Second piece of metal $T_2 = 240 - 3x$ $x = \#$ minutes

Equal
Values
method

$$20 + 2x = 240 - 3x$$

65 starting value \$10.25 + 3\%

think $y = ab^x$

$y = 10.25(1.03)^x$

(a) $100\% + 3\% = 103\%$
 \downarrow
 1.03

(b) function $f(n) = 10.25(1.03)^n$

(c) $f(10) = 10.25(1.03)^{10} =$

67 a $\sqrt[3]{x}$

b $\frac{1}{x^3}$

c $x^{2/3}$

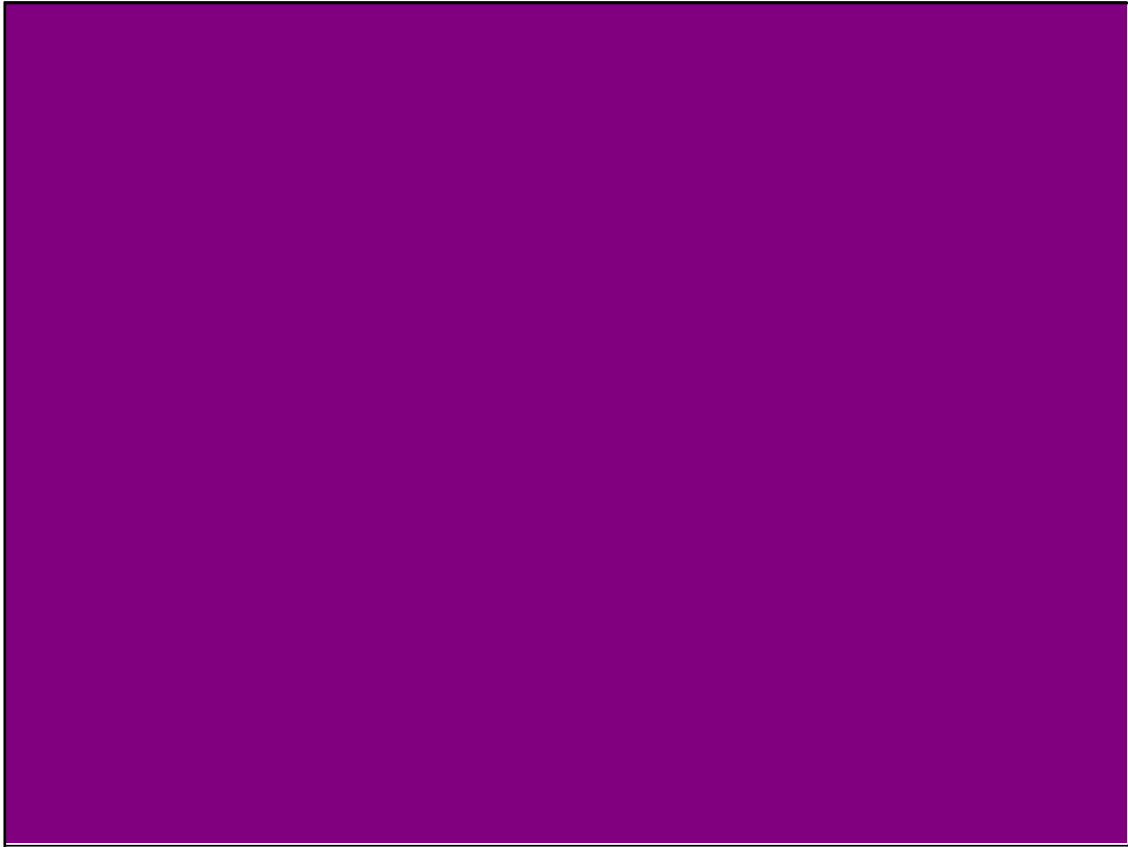
d $\frac{1}{\sqrt{x}} = \frac{1}{x^{1/2}}$

$$e. x^{-1}y^{-8}$$

$$f. (m^2)^{-3/2}$$

$$g. (x^3y^6)^{1/2} = \sqrt{x^3y^6}$$

$$h. (9x^3y^6)^{-2}$$



Yesterday you took two functions

$$g(x) = 4x - 6$$

$$f(x) = 2x + 3$$

and combined them
in various ways

and combined them
in various ways

and some of those combinations
created **Rational**
Functions

$$\frac{2x+3}{4x-3}$$

NOTES →

Today's AIM

simplify and Analyze the
Graphs of

Rational
FUNCTIONS

$$f(x) = \frac{1}{x}$$

parent

$$g(x) = \frac{2x}{3x-7}$$

$$h(x) = \frac{2x^2+3x-7}{2x+5}$$

$$f(x) = \frac{\text{polynomial}}{\text{polynomial}}$$

$$y = x^2 - 3x + 1x^0$$

must be at least
degree 1 (NO
CONSTANTS)

$$x^2$$

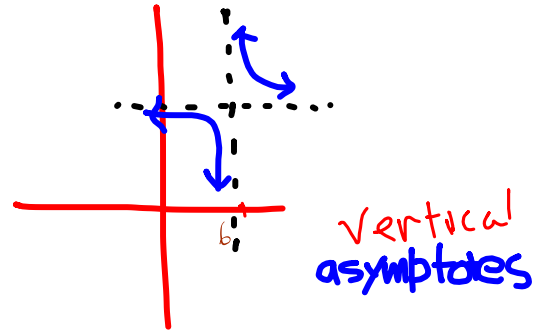
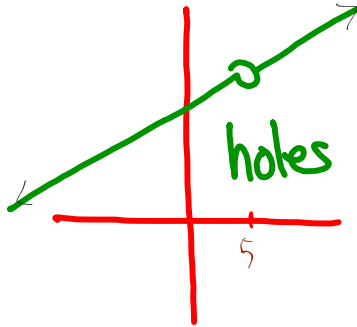
$$x^5$$

$$x^{11}$$

$$4x^7$$

$$x$$

Rational functions create
graphs that have
2 types of vertical discontinuities



Analyzing the Graphs

of

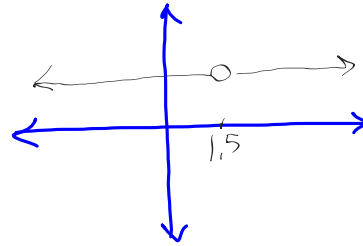
Rational Functions

You'll need your GDC

$$g(x) = \frac{2x-3}{2x-3}$$

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

No GDC's yet



discontinuities : hole at $x=1.5$

domain :

$$-\infty < x < \infty, x \neq 1.5$$

range :

$$y = 1$$

$$2x-3=0$$

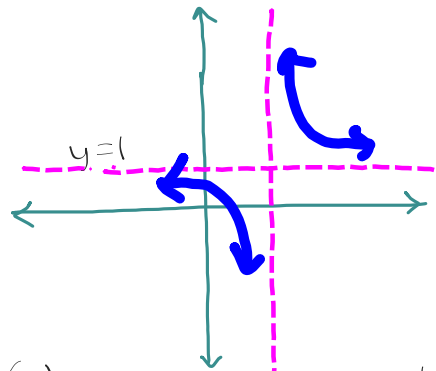
$$2x=3$$

$$x = \frac{3}{2}$$

$$1.5$$

$$h(x) = \frac{2x+3}{2x-3}$$

What's different?



discontinuities :

Vertical (↑) asymptote at $x=1.5$
horizontal (↔) asympt at $y=1$

domain :

$$-\infty < x < \infty, x \neq 1.5$$

range :

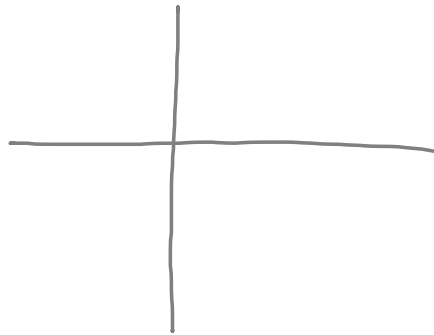
$$-\infty < y < \infty, y \neq 1$$

$$\frac{2B + 3}{2B + 3}$$

$$\frac{2B + 3}{2B + 3}$$

$$\frac{2B}{2B}$$

$$j(x) = \frac{6x + 10}{2x - 8}$$



discontinuities :

domain :

range :

In your notes, do as many of the problems as you can from problem 3-74 in the next 5 minutes

- be sure you write down a problem before you work on it.

a. $\frac{x^2}{x^2} = 1$ but $x \neq 0$

b. $\frac{x}{x} \cdot \frac{x}{x} \cdot \frac{x}{3} = \frac{\cancel{x} \cancel{x} x}{\cancel{3} x^2 1} = \frac{x}{3}$ $x \neq 0$

c. $\frac{\cancel{x-2}}{\cancel{x-2}} \cdot \frac{x+5}{x-1} = \frac{x+5}{x-1}$ $x \neq 1$
 $x \neq 2$

$$d. \frac{\cancel{9} \cdot \cancel{x}}{\cancel{x} \cdot \cancel{9}} = \boxed{x \neq 0} \quad x \neq$$

$$e. \frac{h \cdot h \cdot k}{h} = \boxed{hk, h \neq 0}$$

$$\begin{aligned} 3m+1 &= 0 \\ 3m &= -1 \\ m &= -\frac{1}{3} \end{aligned}$$

$$f. \frac{(2m-5)(\cancel{m+6})}{(\cancel{m+6})(3m+1)} = \boxed{\frac{2m-5}{3m+1} \quad \begin{array}{l} m \neq -6 \\ m \neq -\frac{1}{3} \end{array}}$$

$$g. \frac{\cancel{2} \cdot \cancel{6} \cdot \cancel{(n-2)}^2}{\cancel{3} \cdot \cancel{(n-2)}} = 2n-4, n \neq 2$$

$$2(n-2)$$

$$h. \frac{3-2x}{(4x-1)(3-2x)} = \frac{1}{4x-1} \quad x \neq \frac{1}{4} \quad x \neq \frac{3}{2}$$

$$\begin{aligned} 3-2x &= 0 \\ 3 &= 2x \\ x &= \frac{3}{2} \end{aligned}$$

$$\frac{4x}{x} \rightarrow 4 \quad ?$$

$$\frac{4+x}{x} \rightarrow 5 \quad ?$$

No because $\frac{4+x}{x}$ is same as $(4+x) \div x$

NOTES examples of

Simplifying
Rational expressions

ex. A

$$\frac{x^2 + 6x + 9}{x^2 - 9} = \frac{\cancel{(x+3)}(x+3)}{\cancel{(x+3)}(x-3)} = \boxed{\frac{x+3}{x-3}}$$

ex B

$$\frac{x^2 + 4x}{2x + 8} = \frac{\cancel{x}(x+4)}{2\cancel{(x+4)}}$$

$$\boxed{\frac{x}{2}}$$

ex c

$$\frac{2x^2 - x - 10}{3x^2 + 7x + 2}$$

c. $\frac{28x^2 - x - 15}{28x^2 - x - 15}$

B.B.

Assignment

3 - 78 to 84

😊 Keep up your hard work.

Next TEST

NOV. 2nd

