



{ PICK UP THE WARM UP PLEASE }

any HW questions?



1 Does $f(x) = \frac{3x-1}{x+8}$ have a vertical asymptote? **yes**
 If so, what is its equation?

$$x = -8$$

Does $g(x) = \frac{3x-1}{x+8}$ have a horizontal asymptote? **yes**
 If so find its equation.

$$\frac{\cancel{3x} - 1}{\cancel{x} + 8} = 3$$

$$y = 3$$

2] Does $h(x) = \frac{5x-20}{x-4}$ have a hole or an asymptote?
where?
 $x=4$

3] Simplify $\frac{5n^2 - 45}{15 - 5n} \rightarrow \frac{5(n^2 - 9)}{5(3-n)}$ ^{← DOS}

$$\frac{n+3}{-1}$$

$-(n+3)$

Or $-(n+3)$

$$\frac{(n+3)(\cancel{n-3})}{\cancel{3-n} - (n-3)}$$

④ Solve the Absolute Value equation

$$\frac{|2x-3|}{9} = 2$$

$$|2x-3| = 18 + 2x$$

$$\begin{array}{l} \swarrow \quad \searrow \\ 2x-3 = 18 \quad 2x-3 = -18 \\ \downarrow \quad \quad \quad \downarrow \end{array}$$

HOMEWORK



94] bologna sandwich bacteria
currently 72 million
triples every 24 hours

15 days ago, there was _____ bacteria

FUNCTION

$$y = ab^x$$

$$72\,000\,000 = a(3)^{15}$$

$$a = \frac{72\,000\,000}{3^{15}}$$

$$y = 72\,000\,000 \cdot (3)^{-15}$$

$$a = 5$$

low as 100 ?

96c)

$$\frac{8}{k} = \frac{14}{k+3}$$

$$8(k+3) = 14k$$

$$\boxed{90} \quad a. \frac{x-7}{9(2x-1)} \div \frac{\cancel{(x+5)}(x-7)}{6x \cancel{(x+5)}}$$

$$90 \quad b. \frac{6x^2 - x - 1}{3x^2 + 2x + 8} \cdot \frac{x^2 + 4x - 32}{2x^2 + 7x - 4}$$

$$\left(\frac{\quad}{\quad} \right) \odot \left(\frac{\quad}{\quad} \right)$$

90 b. $\frac{6x^2 - x - 1}{3x^2 + 2x + 8} \cdot \frac{x^2 + 4x - 32}{2x^2 + 7x - 4}$

$\begin{array}{|c|c|c|} \hline & x & 8 \\ \hline x & x^2 & 8x \\ \hline -4 & -4x & -32 \\ \hline \end{array}$

$\frac{(2x-1)(3x+1)}{(3x^2+2x+8)} \cdot \frac{(x+8)(x-4)}{(x+4)(2x-1)}$

$\begin{array}{r} x \quad -32x \\ 2x \quad -16x \\ -4x \quad +8x \end{array}$

91 a $\frac{(x+4)^2}{(x+4)(x-2)} =$

restrictions

$$91b \quad \frac{8(x+2)^3(x-3)^3}{4(x+2)^2(x-3)^5}$$

$$\underline{93b} \quad \begin{aligned} 3x - 2y &= 30 \\ 2x + 3y &= -19 \end{aligned}$$

$$72 = a(3)^{15}$$

96 a. $\frac{m}{6} = \frac{m+1}{5}$

c. $\frac{3x-5}{2} = \frac{4x+1}{4}$



NOTE:

from this point on in this course, you may assume that all values of x that would make a denominator zero are excluded

Add & Subtract

Rational

Expressions

a different process than + or -

1. Simplify individual fractions first

factor!

2. Show a common denominator.

3. Condense to a single fraction.





$$\frac{2}{13} + \frac{5}{13}$$



$$\frac{2+5}{13}$$

Keep



$$\frac{7}{13}$$

$$\frac{a-b}{8b} + \frac{6a-3b}{8b}$$



$$\frac{a-b + 6a-3b}{8b}$$



$$\frac{7a-4b}{8b}$$

$$\frac{m-3n}{6m^3n} - \frac{m+3n}{6m^3n}$$

$$\begin{array}{r} \downarrow \\ m-3n - (m+3n) \\ \hline 6m^3n \end{array}$$

$$\begin{array}{r} \downarrow \\ m-3n - m - 3n \\ \hline 6m^3n \end{array}$$

$$\frac{-6n}{6m^3n}$$

$$\downarrow$$

$$\frac{-1}{m^3}$$



$$\frac{1}{3} + \frac{2}{5} \rightarrow \frac{5+6}{15} \rightarrow \frac{11}{15}$$

$$\frac{1}{3}$$

$$\frac{1}{15}$$

$$\frac{x+4}{2x} - \frac{x-1}{2x^2} \rightarrow \frac{x^2+4x - (x-2)}{2x^2}$$

$$\frac{x^2+3x+2}{2x^2}$$

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

$$\begin{array}{l}
 \begin{array}{l} (2x) \\ (2x) \end{array} \frac{2}{x} + \begin{array}{l} (2) \\ (2) \end{array} \frac{3}{x^2} + \frac{1(x)}{2x(x)} \rightarrow \frac{4x + 6 + x}{2x^2} \\
 \\
 \frac{5x}{2x^2} + \frac{6}{2x^2} \\
 \\
 \frac{5x+6}{2x^2} \\
 \\
 \frac{1}{2} \cdot \frac{5x+6}{x^2}
 \end{array}$$

$$\begin{array}{l}
 6 + \frac{2}{x-4} \\
 \\
 \begin{array}{l} (x-4) \\ (x-4) \end{array} \frac{6}{1} + \frac{2}{x-4} \rightarrow \frac{6x-24+2}{x-4} \\
 \\
 \frac{6x-22}{x-4}
 \end{array}$$



$$\frac{x^2 - 25}{3x^2 + 15x} - \frac{3}{2x}$$

DOS → simple factoring

$$\frac{(x+5)(x-5)}{3x(x+5)} - \frac{3}{2x}$$

$$\frac{(x-5)}{3x} - \frac{3(3)}{2x(3)}$$

$$\frac{2x-19}{6x}$$

$$\frac{2x-10-9}{6x}$$

LEVEL 3

$$\frac{2x(x+5)}{(x-1)(x+5)} + \frac{3(x-1)}{x+5(x-1)}$$

$$\begin{array}{r} \downarrow \\ \frac{2x(x+5) + 3(x-1)}{(x-1)(x+5)} \end{array}$$

$$\begin{array}{r} \downarrow \\ \frac{2x^2 + 10x + 3x - 3}{(x-1)(x+5)} \end{array}$$

$$\frac{2x^2 + 13x - 3}{(x-1)(x+5)}$$

$$\frac{2}{x+4} + \frac{4x-x^2}{x^2-16} \leftarrow \text{Factor!}$$

$$\frac{2}{x+4} + \frac{-x(x-4)}{(x+4)(x-4)} \leftarrow \text{Factor!}$$

$$\frac{2}{x+4} - \frac{x}{x+4} \rightarrow \boxed{\frac{2-x}{x+4}}$$

Assignment

3.2.4 DAY 1 WORKSHEET