

Team Name KEY

2 4 6 8 10

The Junior class has to decorate for the Cotillion. If Becca can complete the decorations for the prom in 5 days working alone, Erin can do it in 3 days, and Camilla can complete it in 4 days, how long would it take them working together?

	D	T	R
Becca	1	5	$\frac{1}{5}$
Erin	1	3	$\frac{1}{3}$
Camilla	1	4	$\frac{1}{4}$

$$60\left(\frac{1}{5}x + \frac{1}{3}x + \frac{1}{4}x = 1\right)$$

$$12x + 20x + 15x = 60$$

$$47x = 60$$

$$x = \frac{60}{47} \text{ days} \approx \boxed{1 \text{ day } 6 \text{ hrs } 38 \text{ min}}$$

Kelly can ride her motorcycle 40 miles in the same time that it takes Laura to travel 15 miles in her car. If Laura drives her car 20 mph slower than Kelly rides her bike, find each of their speeds.

	D	T	R
Kelly	40	x	$\frac{40}{x}$
Laura	15	x	$\frac{15}{x}$

miles hrs mph

$$\frac{15}{x} + 20 = \frac{40}{x}$$

$$20x = 25$$

$$\frac{15}{x} + \frac{20x}{x} = \frac{40}{x}$$

$$x = \frac{25}{20} = \frac{5}{4}$$

$$\frac{20x + 15}{x} = \frac{40}{x}$$

Kelly $\frac{40}{\frac{5}{4}} = \frac{160}{5} = 32 \text{ mph}$
 Laura $\frac{15}{\frac{5}{4}} = \frac{60}{5} = 12 \text{ mph}$

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Solve for x.

a) $\frac{1}{2x+2} + \frac{5}{x^2-1} = \frac{1}{x-1}$ $x \neq -1, 1$

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

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

$$\frac{x-1+10}{2(x+1)(x-1)} = \frac{2x+2}{2(x+1)(x-1)}$$

$$x+9 = 2x+2$$

$$\boxed{7 = x}$$

b) $\frac{2}{x+2} - \frac{1}{x} = \frac{-4}{x^2+2x}$ $x \neq 0, -2$

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

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

$$x-2 = -4$$

$$x = -2$$

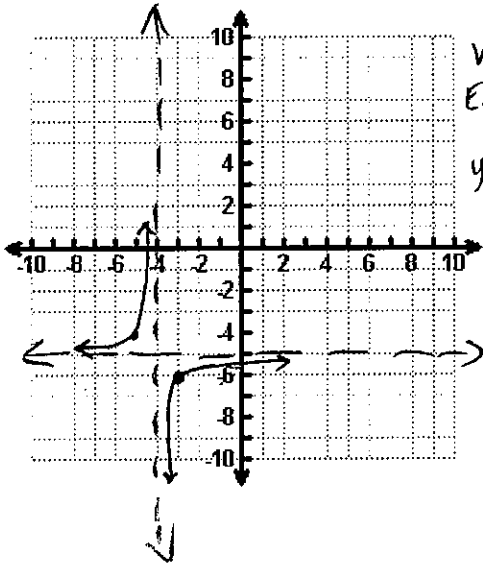
NO SOLUTION

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Graph

a) $f(x) = \frac{-1}{x+4} - 5$



VA $x = -4$
EBA $y = -5$
y-int $(0, -5\frac{1}{4})$

b) $f(x) = \frac{(x-4)(x-1)(x-2)(x+2)}{(2x+1)(x-2)(x-3)}$

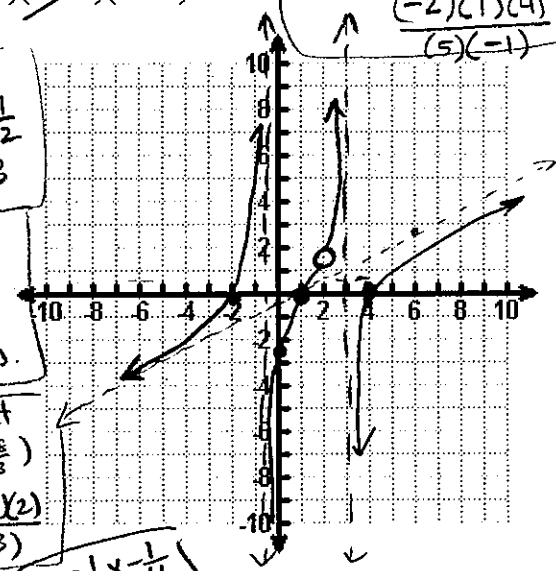
VA
 $x = -\frac{1}{2}$
 $x = 3$

x-int
 $(4, 0)$
 $(1, 0)$
 $(-2, 0)$

y-int
 $(0, \frac{8}{3})$
 $\frac{(-4)(-1)(2)}{(1)(-3)}$

EBA $y = \frac{1}{2}x - \frac{1}{4}$

$\frac{(x^2-5x+4)(x+2)}{2x^2-5x-3}$
Hole @ $(2, \frac{8}{3})$
 $\frac{(-2)(1)(4)}{(5)(-1)}$



$2x^2-5x-3 \overline{) x^3-3x^2-6x+8}$
 $-x^3+\frac{5}{2}x^2$

 $-\frac{1}{2}x^2-6x+8$
 $+\frac{1}{2}x^2$

 $2 \quad 4 \quad 6 \quad 8 \quad 10$

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Simplify

a) $\frac{2x}{x^2-5x-6} + \frac{x-3}{x^2-36}$
 $(x-6)(x+1) \quad (x-6)(x+6)$

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

$\frac{2x^2+12x+x^2-2x-3}{(x-6)(x+1)(x+6)}$

$\frac{3x^2+10x-3}{(x-6)(x+1)(x+6)}$

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

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

$\frac{(x-1)(x-3)}{2} \quad x \neq 2, 1, 3$

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Simplify

a) $\frac{\frac{3(ab)^3}{a-b}}{\frac{4ab}{b-a}}$

$$\frac{3a^2b^2}{a-b} \cdot \frac{-1}{b-a}$$

$$\boxed{\frac{-3a^2b^2}{4} \quad \begin{array}{l} a \neq 0 \\ b \neq 0 \\ a \neq b \end{array}}$$

b) $\frac{\frac{1}{x} - \frac{1}{x-1}}{x}$

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

$$\frac{-1}{x(x-1)} \cdot \frac{1}{x} = \boxed{\frac{-1}{x^2(x-1)}}$$

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FINAL ROUND _____ out of 10

Come up with a word problem that can be represented by the equation $\frac{50}{x-2} + \frac{40}{x} = 10$.