#15 10/15/2012- Sec 7.5 Math 1010

#18

#48

#21

#15 $4x\left(\frac{3}{4x}\right) = \frac{5}{2x}\cdot^{2} - \frac{7}{4}\cdot^{4x}$ LCD: $4x$

D: $x \neq 0$

$3 = 5 \cdot 2 - 7x$

$3 = 10 - 7x$

$-10 \quad -10$

$\frac{-7}{-7} = \frac{-7x}{-7}$

$\boxed{1 = x}$

Check

$\frac{3}{4 \cdot 1} = \frac{5}{2 \cdot 1} - \frac{7}{4}$

$\frac{3}{4} = \frac{5^{2}}{2^{1}} - \frac{7}{4}$

$\frac{3}{4} = \frac{10-7}{4}$

$\frac{3}{4} = \frac{3}{4}$ ✓

#18 $p \cdot^{p} + \frac{15}{p}\cdot^{p} = -8 \cdot^{p}$ LCD: p

D: $p \neq 0$

$p^2 + 15 = -8p$

$+8p \quad +8p$

$p^2 + 8p + 15 = 0$

$(p+3)(p+5) = 0$

$p+3=0 \quad p+5=0$

$-3 \quad -3 \quad -5 \quad -5$

$\boxed{p = -3, \; p = -5}$

#21 $\frac{(x-4)}{(x+6)} = \frac{(2x+3)}{(2x-1)}$ · $(x+6)(2x-1)$

LCD: $(x+6)(2x-1)$

D: $x \neq -6, \frac{1}{2}$

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$(x-4)(2x-1) = (2x+3)(x+6)$

$2x^2 - 9x + 4 = 2x^2 + 15x + 18$

$-2x^2 \quad -15x \quad -18 \quad -2x^2 \quad -15x \quad -18$

$-24x - 14 = 0$

$+14 \quad +14$

$\frac{-24x}{-24} = \frac{14}{-24}$

$\boxed{x = -\frac{7}{12}}$

#48 $\frac{4x-7}{4x^2-9} = \frac{-2x^2+5x-4}{4x^2-9} + \frac{x+1}{2x+3}$ LCD:

D:

$(2x+3)(2x-3) \cdot \frac{(4x-7)}{(2x+3)(2x-3)} = \frac{(-2x^2+5x-4)(2x+3)(2x-3)}{(2x+3)(2x-3)} + \frac{(x+1)(2x+3)(2x-3)}{(2x+3)}$ LCD: $(2x+3)(2x-3)$

D: $x \neq -\frac{3}{2}, \frac{3}{2}$

$4x-7 = -2x^2+5x-4 + (x+1)(2x-3)$

$4x-7 = -2x^2+5x-4+2x^2-x-3$

$4x-7 = 4x-7$

$-4x+7 \quad -4x+7$

$0 = 0$ ← true

$\{x \mid x \neq -\frac{3}{2}, \frac{3}{2}\}$

Sec 7.5 Applications of Rational Expressions

Example of formula using Rational Exp.

$$\frac{1}{f} = \frac{1}{p} + \frac{1}{q}$$

- f: focal length
- p: distance from lense to object
- q: distance from lense to image

$f = 15$ cm, $q = 25$ cm, find p

$$\frac{1}{15} = \frac{1}{p} + \frac{1}{25}$$

LCD: $75p$

D: $p \neq 0$

$$75p \cdot \frac{1}{15} = 75p \cdot \frac{1}{p} + 75p \cdot \frac{1}{25}$$

$15 = 3 \cdot 5$, $25 = 5 \cdot 5$

LCM: $3 \cdot 5 \cdot 5 = 75$

$$5p = 75 + 3p$$

$$-3p \quad -3p$$

$$\frac{2p}{2} = \frac{75}{2}$$

$$p = \frac{75}{2} \text{ cm}$$

We could have solved the formula for p

LCD: fpq

$$fpq \cdot \frac{1}{f} = fpq \cdot \frac{1}{p} + fpq \cdot \frac{1}{q}$$

$$pq = fq + fp$$

$$-fp \quad -fp$$

$$pq - fp = fq$$

$$\frac{p(q-f)}{q-f} = \frac{fq}{q-f}$$

$$p = \frac{fq}{q-f}$$

A Ratio is a comparison of two quantities and can be written

a to b, $a:b$, or $\frac{a}{b}$

A proportion is statement that two Ratio's are equal

Example 4

No ins → $\frac{15}{100} = \frac{x}{302}$ ← No ins

entire group → entire group

$\frac{15}{100} = \frac{x}{302}$ LCD:

If we have $\frac{\text{single fraction}}{\text{single fraction}} = \frac{\text{single fraction}}{\text{fraction}}$

then we can use cross multiplication

$\frac{15}{100} \times \frac{x}{302}$

$15(302) = 100x$

$\frac{4530}{100} = \frac{100x}{100}$

$45.3 = x$

Ans: 45.3 million Americans

without cross multiplying

$100(302) \cdot \frac{15}{100} = \frac{x}{302} \cdot 100(302)$ LCD: $100(302)$

Simplify

$15(302) = 100x$

#28

Snow to Liquid
5 to 1

Snow to Liquid
? to 3.25

$$\frac{5}{1} \Rightarrow \frac{X}{3.25}$$

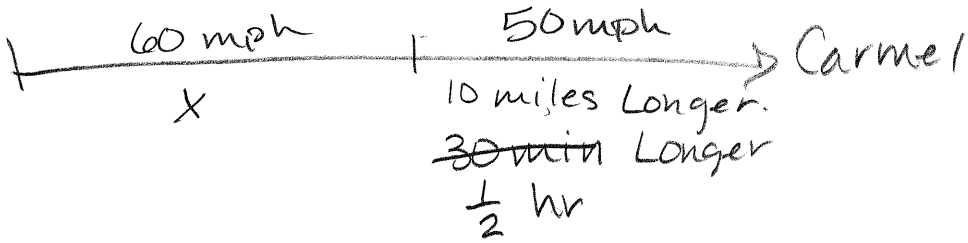
$$5(3.25) = X$$

$$\boxed{16.25 \text{in}} = X$$

Recall: $d = rt$ means $t = \frac{d}{r}$ or $r = \frac{d}{t}$

Remember #51

1. Read & organize info
2. Assign Variable
3. Write an Equation
4. Solve
5. State the Answer
6. Check



	rate	time	distance
1st part	60	$\frac{X}{60}$	X
2nd part	50	$\left(\frac{X}{60}\right) + \frac{1}{2}$	X + 10
		$\frac{X+10}{50}$	

$$300 \cdot \frac{X}{60} + \frac{1}{2} = \frac{(X+10)}{50} \quad \text{LCD: } 300$$

$$5X + 150 = 6X + 60$$

$$90 = 10X$$

$$-5X \quad -60 \quad -5X \quad -60$$

$300 \cdot \frac{x}{60} + \overset{300\cdot}{\frac{1}{2}} = \overset{300\cdot}{\frac{(x+10)}{50}}$

$5x + 150 = 6(x+10)$

$5x + 150 = 6x + 60$

$-5x \quad -60 \qquad -5x \quad -60$

$90 = x$

d for 1st = 90

d the 2nd = 100

Total distance = 190mi