

Review Warmup

1) Factor: $x^4 - 4x^2 \rightarrow x^2(x^2 - 4) = x^2(x+2)(x-2)$

2) Reduce: $\frac{6k - 15}{4k^2 - 25} = \frac{3(2k-5)}{(2k+5)(2k-5)} = \frac{3}{2k+5}$

3) Simplify: $(x + 3)(x - 1) + 2(4x^2 - x)$

$$x^2 - x + 3x - 3 + 8x^2 - 2x$$

$$9x^2 - 3 = 3(3x^2 - 1)$$

Aug 22-3:03 PM

Calc 4 Life

Section R.4

May 13-10:02 PM

Properties of Equality

1) If $a=b$, then $a+c = b+c$

2) If $a=b$, then $ac=bc$

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Solving Linear Equations

a) $x - 2 = 3$

$+2 \quad +2$

$x = 5$

b) $x/2 = 3$

$\cdot 2 \quad \cdot 2$

$x = 6$

c) $2x - 5 + 8x = 3x + 2(2 - 3x)$

$10x - 5 = 3x + 4 - 6x$

$10x - 5 = -3x + 4$
 $+3x \quad +5 \quad +3x \quad +5$

$13x = 9$

$x = \frac{9}{13}$

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Zero-Factor Property

If a and b are real numbers, with $ab=0$, then either $a=0$ or $b=0$ (or both)

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Solving a quadratic equation

$$6r^2 + 7r = 3$$

$-3 -3$

$$6r^2 + 7r - 3 = 0$$

$$(3r - 1)(2r + 3) = 0$$

$$3r - 1 = 0$$

$+1 +1$

$$3r = 1$$

$$r = \frac{1}{3}$$

$$2r + 3 = 0$$

$-3 -3$

$$2r = -3$$

$$r = -\frac{3}{2}$$

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Quadratic Formula...

$$ax^2 + bx + c = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

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Solve $x^2 - 4x - 5 = 0$ by using the quadratic formula

$$a=1 \quad b=-4 \quad c=-5$$

$$\rightarrow (x-5)(x+1) = 0$$

$$x = \frac{4 \pm \sqrt{16 - 4(1)(-5)}}{2(1)} = \frac{4 \pm \sqrt{36}}{2} = \frac{4 \pm 6}{2} = 2 \pm 3$$

$$x = 5, -1$$

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Solve $x^2 + 1 = 4x$ by using the quadratic formula

$$x^2 - 4x + 1 = 0$$

$$a=1, b=-4, c=1$$

$$x = \frac{4 \pm \sqrt{16 - 4 \cdot 1 \cdot 1}}{2 \cdot 1} = \frac{4 \pm \sqrt{12}}{2} = \frac{4 \pm 2\sqrt{3}}{2} = 2 \pm \sqrt{3}$$

$$x = 2 \pm \sqrt{3}$$

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Solving Rational Equations

$$60 \left(\frac{r}{10} - \frac{2}{15} \right) = \left(\frac{r-1}{12} + \frac{3}{20} \right) 60$$

~~$$60 \cdot r$$~~

$$6r - 8 = 5r - 5 + 9$$

~~$$6r - 8 = 5r + 4$$~~
~~$$-5r + 8 \quad -5r + 8$$~~

$$r = 12$$

10	12	15	20
20	24	30	40
30	36	45	60
40	48	60	
50	60		
60			

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Solving Rational Equations

$$x^3 \left(\frac{3}{x^3} - \frac{12}{x} \right) = (0) \cdot x^3$$

$$\frac{3}{x^3} = \frac{12}{x}$$

$$3 - 12x^2 = 0$$

$$\frac{3}{12} = \frac{12x^2}{12}$$

$$\sqrt{\frac{1}{4}} = \sqrt{x^2}$$

$$\pm \frac{1}{2} = x$$

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Solving Rational Equations

$$\frac{2}{m} - \frac{3m}{m+2} = \frac{m}{m^2+2m}$$

$$m(m+2) \left(\frac{2}{m} - \frac{3m}{m+2} \right) = \frac{m}{m(m+2)} \cdot m(m+2)$$

$$\begin{array}{r} (2m+4) \\ -m \end{array} - 3m^2 = \frac{m}{-m}$$

$$-3m^2 + m + 4 = 0$$

$$(-3m+4)(m+1) = 0$$

$$\begin{array}{r} -3m+4=0 \\ -4 \quad -4 \end{array}$$

$$m+1=0$$

$$\begin{array}{r} -3m=-4 \\ -3 \quad -3 \end{array}$$

$$m=-1$$

$$m = \frac{4}{3}$$

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Extraneous solution - solutions of an equation that are not inside the domain of the expressions.

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Solve the rational equation.
Identify any extraneous solutions.

$$y(y-3)\left(\frac{1}{y} + \frac{2}{y-3}\right) = \frac{6}{\cancel{y^2 - 3y}}$$

$y(y-3)$

$$y-3 + 2y = 6$$

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Solve the rational equation.
Identify any extraneous solutions.

$$\frac{x}{x-2} + \frac{3}{x-1} = \frac{-3}{x^2 - 3x + 2}$$

Aug 22-3:03 PM

Homework:

pg. R-16
#5-37 odd

Aug 22-3:03 PM