

Review topics by number

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21.

Solve for c

$$A = \frac{1}{2}(2p + c)$$

$$A = \frac{1}{2}(2p + c)$$

MULTIPLY BY 2

$$2A = 2p + c$$

$$-2p \quad -2p$$

$$\boxed{2A - 2p = c}$$

22.

Solve for a

$$\frac{1}{a} + \frac{1}{b} = \frac{1}{f}$$

multiply by a b f \textcircled{a}

$$\begin{array}{r} bf + af = ab \\ -af \quad -af \end{array}$$

$$bf = ab - af$$

$$\frac{bf}{b-f} = \frac{a(b-f)}{b-f}$$

$$a = \frac{bf}{b-f}$$

23.

Solve for y

$$TL = A[4 - y(xr)]$$

$$TL = A(4 - rxy)$$

$$TL = 4A - Arx$$

$$-4A \quad -4A$$

$$\frac{TL - 4A}{-Arx} = \frac{-Arx}{-Ar}$$

$$y = \frac{TL - 4A}{-Arx}$$

$$y = \frac{TL - 4A}{-Arx}$$

24.

Solve for P

$$\frac{A\left(P - \frac{c}{3}\right)T}{B} = R + T$$

multiply by B

$$\frac{A\left(P - \frac{C}{3}\right)T}{AT} = \frac{RB + T}{AT}$$

$$P - \frac{C}{3} = \frac{RB + T}{AT}$$
$$+ \frac{C}{3} \qquad + \frac{C}{3}$$

$$P = \frac{RB + TB}{AT} + \frac{C}{3}$$

25.

Solve for x

$$\frac{x - 1}{15} = \frac{2}{5}$$

Cross multiply

$$\frac{5(x-1)}{5} = \frac{30}{5}$$

$$\begin{array}{r} x-1 = 6 \\ +1 \quad +1 \end{array}$$

$$\boxed{x=7}$$

26.

Solve for x , list restrictions

$$\frac{4}{6-2x} = \frac{3}{x-5}$$

Cross Multiply

$$4(x-5) = 3(6-2x)$$

$$\begin{array}{r} 4x - 20 = 18 - 6x \\ + 6x \qquad \qquad + 6x \end{array}$$

$$\begin{array}{r} 10x - 20 = 18 \\ + 20 \qquad + 20 \end{array}$$

$$10x = 38$$

$$x = 3.8$$

restrictions $\rightarrow x \neq 5$ or 3

27.

Solve for x, list restrictions

$$\frac{2}{9x - 5} = \frac{5}{3x + 2}$$

Cross multiply

$$2(3x+2) = 5(9x-5)$$

$$6x + 4 = 45x - 25$$

$$\begin{array}{r} -6x \quad -6x \\ \hline \end{array}$$

$$4 = 39x - 25$$

$$\begin{array}{r} +25 \quad +25 \\ \hline \end{array}$$

$$29 = 39x$$

$$x = \frac{29}{39}$$

Restrictions $\rightarrow x \neq \frac{5}{9}$ or $-\frac{2}{3}$

28.

Solve for x , list restrictions

$$\frac{8x + 5}{4x - 7} = \frac{4x + 3}{2x - 1}$$

Cross multiply

$$(8x+5)(2x-1) = (4x+3)(4x-7)$$

$$\boxed{16x^2} - 8x + 10x - 5 = \overset{\text{foil}}{\boxed{16x^2}} - 28x + 12x - 21$$

$$\begin{array}{r} 2x - 5 = -16x - 21 \\ +16x \quad \quad +16x \\ \hline \end{array}$$

$$\begin{array}{r} 18x - 5 = -21 \\ \quad \quad +5 \quad \quad +5 \\ \hline \end{array}$$

$$18x = -16$$

$$\boxed{x = -8/9}$$

Restrictions $x \neq \frac{1}{2}$ or $\frac{7}{4}$

29.

Solve for x , *list restrictions*

$$\frac{10}{x(x-2)} + \frac{4}{x} = \frac{5}{x-2}$$

MULTIPLY by LCD

$$\text{LCD} = x(x-2)$$

$$10 + 4(x-2) = 5(x)$$

$$10 + 4x - 8 = 5x$$

$$\begin{array}{r} -4x \quad -4x \\ \hline \end{array}$$

$$\boxed{\cancel{2 = x}}$$

no solution

Restrictions $x \neq 0$ or 2

30.

Solve for x , list restrictions

$$\frac{3x}{x-1} = 3 + \frac{7}{3x+1}$$

MULTIPLY by LCD

$$\text{LCD} = (x-1)(3x+1)$$

$$3x(3x+1) = 3(x-1)(3x+1) + 7(x-1)$$

$$9x^2 + 3x = 3(3x^2 + x - 3x - 1) + 7x - 7$$

$$\boxed{9x^2} + 3x = \boxed{9x^2} - 6x - 3 + 7x - 7$$

$$3x = x - 10$$

$$\begin{array}{r} -x \quad -x \\ \hline \end{array}$$

$$2x = -10$$

$$\boxed{x = -5}$$

Restrictions $x \neq 1$ or $-\frac{1}{3}$

31.

Solve the Work problem.

Two different pipes fill a swimming pool at a city pool. When the hot is turned on, it can fill the pool in 16 hrs. When the hot and cold are turned on together, the pool is filled in 6 hrs. How long does it take to fill the pool using just the cold water? Express your answer in hrs. and min.

name	Q	r	t
hot	1	$\frac{1}{16}$	16
cold	1	$\frac{1}{2}$	t
Tog	1	$\frac{1}{6}$	6

$$\frac{1}{16} + \frac{1}{t} = \frac{1}{6} \quad \text{multiply by LCD } 48t$$

$$3t + 48 = 8t \quad \leftarrow$$

$$48 = 5t$$

$$t = \frac{48}{5} = 9.6 \text{ hrs}$$

9 hrs 36 min

32.

Solve the quadratic equation using the quadratic formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$$3x^2 + 5x = 6$$

Round to nearest tenth.

$$3x^2 + 5x = 6$$

$$3x^2 + 5x - 6 = 0$$

$$a=3 \quad b=5 \quad c=-6$$

$$x = \frac{-5 \pm \sqrt{5^2 - 4 \cdot 3 \cdot -6}}{2 \cdot 3}$$

$$x = \frac{-5 \pm \sqrt{25 - (-72)}}{6}$$

$$x = \frac{-5 \pm \sqrt{97}}{6}$$

$$\frac{-5 + \sqrt{97}}{6} \quad \text{or} \quad \frac{-5 - \sqrt{97}}{6}$$

$$\approx \boxed{.8} \quad \text{or} \quad \boxed{-2.5}$$

33.

Solve the quadratic equation using the quadratic formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$$2x^2 + 10x - 5 = 0$$

Round to nearest tenth

$$2x^2 + 10x - 5 = 0$$

$$a = 2 \quad b = 10 \quad c = -5$$

$$x = \frac{-10 \pm \sqrt{10^2 - 4 \cdot 2 \cdot (-5)}}{2 \cdot 2}$$

$$\frac{-10 \pm \sqrt{100 - (-40)}}{4}$$

$$\frac{-10 + \sqrt{140}}{4} \quad \text{or} \quad \frac{-10 - \sqrt{140}}{4}$$

$$x \approx \boxed{.5} \quad \text{or} \quad \boxed{-5.5}$$

34.

Solve for x *by factoring*

$$2x^2 + 7x = 4$$

$$\begin{array}{r} 2x^2 + 7x = 4 \\ -4 \quad -4 \\ \hline \end{array}$$

$$2x^2 + 7x - 4 = 0$$

$$2x^2 + 8x - x - 4 = 0 \quad \begin{array}{r} -8 \\ \hline -4 \mid 2 \\ 8 \mid -1 \end{array}$$

$$(2x^2 + 8x) + (-x - 4) = 0$$

$$2x(x+4) - 1(x+4)$$

$$(2x-1)(x+4) = 0$$

$$\begin{array}{r} 2x - 1 = 0 \\ +1 \quad +1 \\ \hline \end{array}$$

$$\begin{array}{r} x + 4 = 0 \\ -4 \quad -4 \\ \hline \end{array}$$

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

$$\boxed{x = -4}$$

35.

Solve for x by factoring

$$3x^2 - 10x - 8 = 0$$

$$3x^2 - 10x - 8 = 0$$

$$3x^2 - 12x + 2x - 8 = 0$$

$$(3x^2 - 12x) + (2x - 8) = 0$$

$$3x(x - 4) + 2(x - 4) = 0$$

$$(3x + 2)(x - 4) = 0$$

$$3x + 2 = 0$$

$$\begin{array}{r} -2 \quad -2 \\ \hline \end{array}$$

$$\begin{array}{r} 3x = -2 \\ \hline 3 \end{array}$$

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

$$x - 4 = 0$$

$$\begin{array}{r} +4 \quad +4 \\ \hline \end{array}$$

$$\boxed{x = 4}$$

	-24		+	
	-8		3	-5
	-12		2	-10

36.

Solve for x *by factoring*

$$456x^2 - 34x - 6 = 0$$

$$456x^2 - 34x - 6 = 0$$

$$456x^2 + 38x - 72x - 6 = 0$$

$$(456x^2 + 38x) + (-72x - 6) = 0$$

$$38x(12x + 1) + -6(12x + 1) = 0$$

$$(38x - 6)(12x + 1) = 0$$

$$\begin{array}{r} 38x - 6 = 0 \\ +6 \quad +6 \\ \hline \end{array}$$

$$\frac{38x}{38} = \frac{6}{38}$$

$$x = \frac{3}{19}$$

$$\begin{array}{r} 12x + 1 = 0 \\ -1 \quad -1 \\ \hline \end{array}$$

$$\frac{12x}{12} = \frac{-1}{12}$$

$$x = -\frac{1}{12}$$

$$\begin{array}{r} -2736 \mid + \\ \hline \end{array}$$

$$456 \mid -6$$

$$228 \mid -12$$

$$-76 \mid 36 \mid -40$$

$$-38 \mid 72 \mid -34$$

37.

Solve for x *by factoring*

$$289x^2 + 68x + 4 = 0$$

$$289x^2 + 68x + 4 = 0$$

$$289x^2 + 34x + 34x + 4 = 0$$

$$(289x^2 + 34x) + (34x + 4)$$

$$17x(17x + 2) + 2(17x + 2) = 0$$

$$(17x + 2)(17x + 2) = 0$$

$$17x + 2 = 0$$

$$\begin{array}{r} -2 \quad -2 \\ \hline \end{array}$$

$$\frac{17x}{17} = \frac{-2}{17}$$

$$x = -\frac{2}{17}$$

$$\begin{array}{r|l} 1156 & + \\ \hline 289 & 4 \quad 293 \\ 17 & 68 \quad 85 \\ \hline 34 & 34 \quad 68 \end{array}$$

38.

olve for t by completing the square

$$3t^2 + 12t - 2 = 0$$

Round to thousandths place

$$3t^2 + 12t - 2 = 0$$

$$\frac{3t^2}{3} + \frac{12t}{3} = \frac{2}{3} \quad \left(\frac{4}{2}\right)^2 = 4$$

$$t^2 + 4t + \underline{4} = \frac{2}{3} \quad \lrcorner$$

$$t^2 + 4t + 4 = 4\frac{2}{3}$$

$$(t+2)^2 = 4\frac{2}{3}$$

$$\sqrt{(t+2)^2} = \sqrt{4\frac{2}{3}}$$

$$t+2 = \pm \sqrt{4\frac{2}{3}}$$

-2 -2

$$t = -2 \pm \sqrt{4\frac{2}{3}}$$

$$\boxed{.160\checkmark} \quad \& \quad \boxed{-4.160\checkmark}$$

39.

Solve for x by completing the square

$$5x^2 - 10x + 3 = 0$$

Round to thousandths place

$$5x^2 - 10x + 3 = 0$$

$$\frac{5x^2}{5} - \frac{10x}{5} = \frac{-3}{5} \quad \left(\frac{-2}{2}\right)^2 = 1$$

$$x^2 - 2x + \underline{\quad} = \frac{-3}{5}$$

$$x^2 - 2x + 1 = \frac{-3}{5} + 1$$

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

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

$$x-1 = \pm \sqrt{\frac{2}{5}}$$

$$x = 1 \pm \sqrt{\frac{2}{5}}$$

$$\boxed{1.632} \quad \& \quad \boxed{.368}$$

40.

Solve for x *by completing the square*

$$10x^2 + 12x - 5 = 0$$

Round to thousandths place

$$10x^2 + 12x - 5 = 0$$

+5 +5

$$\frac{10x^2}{10} + \frac{12x}{10} = \frac{5}{10} \quad \left(\frac{1.2}{2}\right)^2 = .36$$

$$x^2 + 1.2x + \underline{\hspace{2cm}} = .5$$

$$x^2 + 1.2x + .36 = .5 + .36$$

$$(x + .6)^2 = .86$$

$$\sqrt{(x + .6)^2} = \sqrt{.86}$$

$$x + .6 = \pm \sqrt{.86}$$

- .6 - .6

$$x = -.6 \pm \sqrt{.86}$$

$$\boxed{.327} \text{ \& } \boxed{-1.527}$$