MATH 1540 Fall 2019 Homework 1

Section 2.2

#6) Solve

$$7x+2=3x-9$$

Soln: Subtract $3x$ from both sides to get

$$4x+2=-9$$

Subtract 2 from both sides to get

$$4x=-11$$

Divide both sides by 4 to get

$$\boxed{x=\frac{-11}{4}.}$$

#9) Solve

$$12-5(x+3)=2x-5$$

Soln: Use distributive property to get

$$12-5x-15=2x-5$$

Simplify left side to get

$$-3-5x=2x-5$$

Add $5x$ to both sides to get

$$-3=7x-5$$

Add 5 to both sides to get

$$2=7x$$

Divide both sides by 7 to get

$$\boxed{x=\frac{2}{7}}$$

#14) Solve

$$\frac{2x}{3} - \frac{3}{4} = \frac{x}{6} + \frac{21}{4}$$

Soln: Add $\frac{3}{4}$ to get

$$\frac{2x}{3} = \frac{x}{6} + \frac{24}{4}$$

Subtract $\frac{x}{6}$ to get

$$\underbrace{\frac{2x}{3} - \frac{x}{6}}_{\text{need common denominator: } \frac{2x}{3} = \frac{4x}{6}} = \frac{24}{4} \quad (=6)$$

So we have

$$\frac{4x}{6} - \frac{x}{6} = 6$$

Simplify left side to get

$$\frac{3x}{6} = 6$$

Multiply by 6 to get

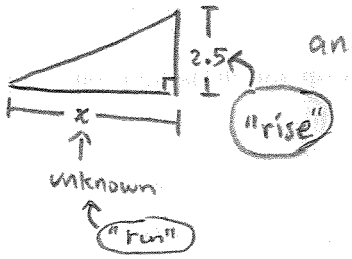
$$3x = 36$$

Divide by 3 to get

$$\boxed{x = 12}$$

#55) need: slope $= \frac{1}{12}$

know:



and slope $= \frac{\text{"rise"}}{\text{"run"}}$

Soln: We have to find x, where

$$\frac{1}{12} = \frac{2.5}{x}$$

Multiply by x to get $\frac{x}{12} = 2.5$

Multiply by 12 to get $x = (2.5)(12) = 30$ ft

Therefore, the wheelchair ramp must extend 30ft from the home in this scenario.

Section 2.5

#11 Solve $3x^2 - 75 = 0$

Soln: Add 75 to get

$$3x^2 = 75$$

Divide by 3 to get

$$x^2 = 25$$

Take square root of equation (don't forget $\pm$)

$$\boxed{x = \pm\sqrt{25} = \pm 5}$$

#14 Solve $2x^2 + 14x = 36$

Soln: Subtract 36 to get

$$2x^2 + 14x - 36 = 0$$

Divide by 2 to get

$$x^2 + 7x - 18 = 0$$

} technically optional, but it makes the following step easier

Use quadratic formula with $a = 1$, $b = 7$, $c = -18$ to get

$$x = \frac{-7 \pm \sqrt{7^2 - 4(1)(-18)}}{2(1)} = -\frac{7}{2} \pm \frac{\sqrt{49 + 72}}{2}$$

$$= -\frac{7}{2} \pm \frac{\sqrt{121}}{2}$$

$$= -\frac{7}{2} \pm \frac{11}{2}$$

$$= -\frac{7}{2} + \frac{11}{2} \qquad = -\frac{7}{2} - \frac{11}{2}$$

$$= \frac{4}{2} \qquad = -\frac{18}{2}$$

$$= 2 \qquad = -9$$

#39| Solve $x^2+x=4$.

Soln: Subtract 4 to get

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

Use quadratic formula with $a=1$, $b=1$, and $c=-4$ to get

$$x=\frac{-1\pm\sqrt{1^2-4(1)(-4)}}{2(1)}$$

$$=-\frac{1}{2}\pm\frac{\sqrt{1+16}}{2}=-\frac{1}{2}\pm\frac{\sqrt{17}}{2}$$

Section 3.1

#68| Given: $f(x)=4-2x$

Compute:

$f(-2)=4-2(-2)=4+4=8$

$f(-1)=4-2(-1)=4+2=6$

$f(0)=4-2(0)=4-0=4$

$f(1)=4-2(1)=4-2=2$

$f(2)=4-2(2)=4-4=0$

#71| Given: $f(x)=3+\sqrt{x+3}$

Compute: $f(-2)=3+\sqrt{-2+3}=3+\sqrt{1}=3+1=4$

$f(-1)=3+\sqrt{-1+3}=3+\sqrt{2}$

$f(0)=3+\sqrt{0+3}=3+\sqrt{3}$

$f(1)=3+\sqrt{1+3}=3+\sqrt{4}=3+2=5$

$f(2)=3+\sqrt{2+3}=3+\sqrt{5}$

perfect answers — leave them as-is