

# Math 1340

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Trojillo

$$1.) x^2 + 7x - 18 = 0$$
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2(a)}$$

$$b^2 - 4ac = 7^2 - 4(1)(-18)$$
$$= 49 + 72$$
$$= 121$$

$$x = \frac{-7 \pm \sqrt{121}}{2(1)}$$

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

$$x = \frac{-7 + 11}{2} \quad x = \frac{-7 - 11}{2}$$

$$x = 2 \quad x = -9$$

$$(2)^2 + 7(2) - 18 = 0$$
$$4 + 14 - 18 = 0 \checkmark$$

$$x \in (2, -9)$$

Good!

$$2.) 5.89x^2 - 13.09x + 7.26 = 0$$

$$100(5.89x^2 - 13.09x + 7.26)$$

$$589x^2 - 1309x + 726 = 0$$

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

$$b^2 - 4ac = -1309^2 - 4(589)(726)$$

$$= 1,713,481 - 1,710,456$$

$$= 3,025$$

$$x = \frac{1309 \pm \sqrt{3,025}}{2(589)}$$

$$x = \frac{1309 \pm 55}{1178}$$

$$1178$$

$$x \neq 1.0645$$

$$x \neq 1.1579$$

$$x \notin (1.0645, 1.1579)$$

All of these decimals  
are rounded. "=" means  
"exact". When there is  
rounding, use " $\approx$ " instead.  
:-)

# Mat 1340

3.)  $25x^2 - 20x + 7 = 0$

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

$$b^2 - 4ac = -20^2 - 4(25)(7)$$

$$= 400 - 700$$

$$= -300$$

$$x = \frac{20 \pm \sqrt{-300}}{2(25)}$$

$$x = \frac{20 \pm 10j\sqrt{3}}{50}$$

$$x = \frac{2 \pm j\sqrt{3}}{5}$$

"=" doesn't use the brackets.  
"ε" needs them.

5.)  $x^2 + 7x - 18 = 0$

$$x^2 + 9x - 2x - 18 = 0$$

$$x(x+9) - 2(x+9) = 0$$

$$(x+9)(x-2) = 0$$

$$x+9=0 \quad x-2=0$$

$$x = -9 \text{ or } x = 2$$

$$x \in \{-9, 2\}$$

4.)  $3mx^2 - 2wx + 5r = 0$

leave this  
H out to  
factor easier

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

$a = 3m \quad b = -2w \quad c = 5r$

$$b^2 - 4ac = (-2w)^2 - 4(3m)(5r)$$

$$= 4w^2 - 60mr$$

$$x = \frac{2w \pm \sqrt{4w^2 - 60mr}}{2(3m)}$$

$$x = \frac{2w \pm \sqrt{4w^2 - 60mr}}{6m}$$

Pretty Close

$$4w^2 - 4(15mr)$$

$$= 4(w^2 - 15mr)$$

$$\Rightarrow \frac{2w \pm 2\sqrt{w^2 - 15mr}}{3m}$$

$$x = \frac{w \pm \sqrt{w^2 - 15mr}}{3m}$$

Mat 1340

$$6.) 589x^2 - 1309x + 726 = 0$$

$$a = 589 \quad b = -1309 \quad c = 726$$

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

$$b^2 - 4ac = (-1309)^2 - 4(589)(726)$$

$$= 1,713,481 - 1,710,456$$

$$= 3,025$$

$$x = \frac{1309 \pm \sqrt{3025}}{2(589)}$$

$$x = \frac{1309 \pm 55}{1,178}$$

$$x = -\frac{627}{589} = -\frac{33}{31} \quad x = \frac{682}{589} = \frac{22}{19}$$

$$x \in \left\{ \frac{-627}{589}, \frac{682}{589} \right\}$$

need to show  
that

$$x = \frac{33}{31}, \frac{22}{19}$$

$$\Rightarrow \frac{(31x-33)(19x-22)}{\text{in factored form}} = 0$$

# Mat 1340

$$7.) x^2 - 7x - 18 = 0$$

$$x^2 + 7x \quad \underline{\quad} = 18$$

$$x^2 + 7x + \frac{49}{4} = 18 + \frac{49}{4}$$

$$\left(x + \frac{7}{2}\right)^2 = \frac{72}{4} + \frac{49}{4}$$

$$\left(x + \frac{7}{2}\right)^2 = \frac{121}{4}$$

$$x = -\frac{7}{2} \pm \sqrt{\frac{121}{4}}$$

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

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

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

$$x = -9$$

$$x = +2$$

$$x \in \{-9, 2\}$$

*make sure radical covers the whole fractions.*

$$8.) x^2 - 24x - 9 = 0$$

$$x^2 - 24x \quad \underline{\quad} = 9$$

$$x^2 - 24x + 144 = 9 + 144$$

$$(x - 12)^2 = 153$$

$$x = 12 \pm \sqrt{153}$$

$$x \in \left\{ \cancel{12} \pm 3\sqrt{17} \right\}$$

*Either "x ∈ {stuff}" or "x = stuff"*

$$9.) 5x^2 + 2x + 3 = 0$$

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

*so they're equal.*

$$5\left(x^2 + \frac{2}{5}x + \frac{1}{25}\right) = -3 + \frac{5}{25}$$

$$5\left(x + \frac{1}{5}\right)^2 = \frac{-75}{25} + \frac{1}{25} = -\frac{15}{5} + \frac{1}{5}$$

$$5\left(x + \frac{1}{5}\right)^2 = \frac{-74}{25} - \frac{14}{5}$$

$$\left(x + \frac{1}{5}\right)^2 = \frac{-74}{25} \cdot \frac{1}{5}$$

$$\left(x + \frac{1}{5}\right)^2 = \frac{-74}{125}$$

$$x = -\frac{1}{5} \pm \sqrt{\frac{-74}{125}}$$

$$x = -\frac{1}{5} \pm \frac{\sqrt{-74}}{5\sqrt{5}} \quad x = \left\{ -1 \pm \frac{\sqrt{-74}}{\sqrt{5}} \right\}$$

*-2*

*-3.5*

# Mat 1340

$$10.) 4x^2 - 16x + 11 = 0$$

$$\frac{b}{2} = \frac{-16}{2} = -8 \quad \left(\frac{b}{2}\right)^2 = (-8)^2 = 64$$

$$4\left(x^2 - \frac{16x}{4} + \underline{\quad}\right) = -11$$

$$4(x^2 - 4x + 4) = -11 + 16$$

$$4(x-2)^2 = -11 + 16$$

$$4(x-2)^2 = 5$$

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

$$x = 2 \pm \sqrt{\frac{5}{4}}$$

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

$$x \in \left\{ 2 \pm \frac{\sqrt{5}}{2} \right\}$$

*Nice work!*