

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

$A=1 \ B=7 \ C=-18$

$(7)^2 - 4 \cdot 1 \cdot (-18)$   
 $49 + 72 = 121$

Discriminant = 121

$x = -9, 2$

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

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

$\frac{4}{2} = 2 \quad \frac{-18}{2} = -9$

Solutions

Important to have this.

2)  $5.89x^2 - 13.09x + 7.26 = 0$   $A=5.89 \ B=-13.09 \ C=7.26$

$(-13.09)^2 - 4 \cdot 5.89 \cdot 7.26$

$171.3481 - 171.0456 = .3025$

Discriminant = .3025  
 $1.1579, 1.0645$

$x = \frac{-(-13.09) \pm \sqrt{.3025}}{2 \cdot 5.89}$

$x = \frac{+13.09 \pm .3025}{11.78}$   
 $\frac{+13.09 + .3025}{11.78} \approx 1.06452$   
 $\frac{+13.09 - .3025}{11.78} \approx 1.15793$

Solutions

"=" means exact.

When there is rounding, use "≈".

-1.5

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

$A=25 \ B=-20 \ C=7$

$(-20)^2 - 4 \cdot 25 \cdot 7$   
 $400 - 700 = -300$

Discriminant = -300  
 $x_1 = \frac{2 + \sqrt{3}}{5}i, \ x_2 = \frac{2 - \sqrt{3}}{5}i$

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

$x = \frac{20 \pm 10\sqrt{3}i}{50}$   
 $x = \frac{2 \pm \sqrt{3}i}{5}$

can stop here.

"i" doesn't go inside the radical... got it on the answer though.

4)  $3mx^2 - 2wx + 5r = 0$   $A=3m \ B=-2w \ C=5r$

$(-2w)^2 - 4 \cdot 3m \cdot 5r$   
 $4w^2 - 60mr$

discriminant:  $w^2 - 15mr$   
 $x_1 = \frac{-w + \sqrt{w^2 - 15mr}}{m}, \ x_2 = \frac{-w - \sqrt{w^2 - 15mr}}{m}$

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

$x = \frac{+2w \pm \sqrt{w^2 - 15mr}}{6m}$

$\frac{2}{3} = 2 \div 3 = 2 \div 2 = 1$

What happens between here and here?

-2

-4.5

MAT 1340

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

$$= \overset{\uparrow}{9}x - 2x$$

$$x + 9 = 0 - 9$$

$$x = \overset{-9}{-} \overset{+2}{+} = 0$$

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

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

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

$$x_1 = -9, x_2 = 2$$

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

$$= -627x - 682x$$

$$x^2 - 627x - 682x + 726 = 0$$

$$19x \cdot (31x - 33) - 682x + 726 = 0$$

$$19x \cdot (31x - 33) - 22(31x - 33) = 0$$

$$31x - 33 = 0$$

$$\uparrow 22 \uparrow 22$$

$$19x - 22 = 0$$

$$\uparrow 22 \uparrow 22$$

$$x_1 = \frac{33}{31}, x_2 = \frac{22}{19}$$

how? where did you get these numbers?

-2.5

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

$$a^2 + 2ab + b^2 = (a+b)^2$$

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

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

$$x^2 + 7x \left(\frac{7}{2}\right)^2 = 18 + ?$$

$$x^2 + 7x \left(\frac{49}{4}\right) = 18 + \frac{49^2}{4}$$

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

$$\left(x + \frac{7}{2}\right)^2 = 18 + \frac{49}{4}$$

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

$$- \frac{7}{2} \quad - \frac{7}{2}$$

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

$$- \frac{7}{2} \quad - \frac{7}{2}$$

$$x = \frac{-18}{2}$$

$$x = \frac{4}{2}$$

$$x = -9, 2$$

Important

hard to follow

-1

-3.5

MAT 1340

8)  $x^2 - 24x - 9 = 0$   $(\frac{b}{2})^2$   $b = -24$   $(\frac{-24}{2})^2 = \frac{576}{4} = 144$

Good writing here!

$x^2 - 24x + 144 = 9 + 144$   
 $x^2 - 24x + 144 = 153$

$x_1 = 12 + 3 \cdot \sqrt{17}$   
 $x_2 = 12 - 3 \cdot \sqrt{17}$

Keep the flow "top-to-bottom" like this!  
 $(x-12)^2 = 153$   
 $x-12 = \pm \sqrt{153}$   
 $+12$   $+12$   
 $x = 12 \pm \sqrt{153}$   
 $x = 12 \pm \sqrt{3 \cdot 3 \cdot 17}$

\*style note\* you can keep the soln combined as "x"  
 $x = 12 \pm 3\sqrt{17}$

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

a little harder to follow this one...

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

$(x + \frac{1}{5})^2 = -\frac{14}{25}$   
 $x + \frac{1}{5} = \frac{-14}{25} - \frac{1}{5}$   
 $x = -\frac{1}{5} \pm \frac{\sqrt{14}}{5}$

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

$x^2 - 4x = -\frac{11}{4} + 4$   
 $x^2 - 4x + 4 = (-\frac{11}{4} + 4)$   
 $x^2 - 2 \cdot x \cdot 2 + 2^2 = -\frac{11}{4} + 4$   
 $(x-2)^2 = \frac{-11+16}{4} = \frac{5}{4}$

$x-2 = \pm \sqrt{\frac{5}{4}}$   
 $x_1 = -\frac{\sqrt{5}}{2} + 2, x_2 = \frac{\sqrt{5}}{2} + 2$

Backwards radicals?

\*style\*

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

Isabella,

You do good work, it can just be hard to follow at times. Not to worry, good habits are learned over time! A tip or two you could try...

- Work from top → bottom (like you did on #8!) instead of working left → right.
- Start towards the center of the page - this leaves you good margins on the sides for if you or someone else wants to make any notes / changes to your work.

I fully graded this time but please know that moving forward, if it is too hard to read it will not be graded and points may be lost.

Have a great day!  
😊