Mat 1340

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① $x^2+7x-18=0$

$26/50$

$a=1 \quad B=7 \quad c=-18$

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

$$x=\frac{-7\pm\sqrt{121}}{2} \leftarrow \text{Discriminant}$$

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

$$x=\frac{4}{2}, \frac{-18}{2}$$

$x=2,-9$

Style Note
Give sets from small→large. ie: $x=-9,2$

② $5.89x^2-13.09x+7.26=0$

$a=5.89 \quad b=13.09 \quad c=7.26$

$$x=\frac{-(-13.09)\pm\sqrt{-13.09^2-4(5.89\cdot 7.26)}}{2\cdot 5.89}$$

↑ Figure this out separately, then plug it in to the radical.

$$x=\frac{13.09\pm\sqrt{-171.0456}}{11.78}$$

This didn't come out right...

$$x=\frac{-157.9556}{11.78}, \frac{184.1356}{11.78}$$

-0

Mat 1340 Pg 2

② What's going on here?

$x \approx -13.4088, 15.6312$

← Even though these weren't the right #s, because they are rounded you should use "$x \approx$" -4

③ $25x^2 - 20x + 7 = 0$

$a=25 \quad b=-20 \quad c=7$

$$\frac{20 \pm \sqrt{-20^2 - 4(25 \cdot 7)}}{50}$$

→ Do this part and skip to plug it in here.

$$\frac{20 \pm \sqrt{-300}}{50}$$

OK up to here.

← What happens between these steps?

$\frac{20+30i}{50} \quad \frac{20-30i}{50}$

If I can see more steps, I can help point out where things go wrong and how to fix it!

$x = -\frac{28}{5}, \frac{32}{5}, x = 1i, \frac{1}{5}i$

$x = \frac{2 \pm i\sqrt{3}}{5}$ -4

④ $3mx^2 - 2wx + 5r = 0$

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

leave out this 4 to factor it later

$$\frac{-(-2w) \pm \sqrt{-2w^2 - 4(3m \cdot 5r)}}{2 \cdot 3m}$$

-8

④

$$\frac{2w \pm \sqrt{(-2w^2 - 60mr)}}{6m}$$

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

~~Simplify and divide into cases~~ NO

$$x = \frac{w + \sqrt{2w^2 - 30mr}}{3m}, \quad \frac{w - \sqrt{2w^2 + 30mr}}{3m}$$

Don't forget the radicals! -2

... w/ the 4 from before...

$$\frac{2w \pm \sqrt{4w^2 - 4(15mr)}}{6m}$$

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

$$\Rightarrow \frac{2w \pm 2\sqrt{w^2 - 15mr}}{6m}$$

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

⑤ $x^2 + 7x - 18 = 0$

rewrite with addition

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

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

$x + 9 = 0$

$x - 2 = 0$

$x = -9, 2$

⑥ $589x^2 - 1309x + 726 = 0$

$a = 589 \quad B = -1309 \quad C = 726$

$$\frac{1309 \pm \sqrt{-1309^2 - 4 \cdot 427614}}{2a}$$

$$\frac{1309 \pm \sqrt{-1309^2 - 1710456}}{}$$

$$\frac{1309 \pm \sqrt{3025}}{}$$

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

$$\frac{1254}{1178} \quad \frac{1364}{1178}$$

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

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

Factored Form

Make sure radicals cover everything they are supposed to.

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⑦ $x^2+7x-18=0$

$\left(\frac{7}{2}\right)^2$ ← Solve this: $\left(\frac{7}{2}\right)^2=\frac{7^2}{2^2}=\frac{49}{4}$

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

$18\left(\frac{4}{4}\right)+\frac{49}{4}=\frac{121}{4}$

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

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

$\sqrt{\left(x+\frac{7}{2}\right)^2}=\sqrt{18+\left(\frac{7}{2}\right)^2}$ $\pm\sqrt{\frac{121}{4}}=\pm\frac{11}{2}$

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

$x=\frac{-7\pm11}{2}$ → $x=-9,2$

use the LCD here...

$x\in-2\pm\sqrt{18+\frac{7}{2}}$

$x^2+7x-18=\left(x-\left(-2+\sqrt{18+\frac{7}{2}}\right)\right)\left(x-\left(-2-\sqrt{18+\frac{7}{2}}\right)\right)$ -5

⑧ $x^2-24x-9$

$x^2-24x\left(-\frac{24}{2}\right)^2-9=\left(-\frac{24}{2}\right)^2$

$\left(x-\frac{24}{2}\right)^2-9=\left(\frac{24}{2}\right)^2$

-5

Mat 1340

⑧ $(x-12)^2 - 9 = 144$

$(x-12)^2 = 9 + 144$

$\sqrt{(x-12)^2} = \sqrt{153}$

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

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

"=" doesn't use the "{}" brackets, but "∈" does. -1

⑨ $5x^2 + 2x + 3 = 0$

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

$5\left(x^2 + \frac{2}{5}x\left(\frac{2}{10}\right)^2\right) = 5 + 5\left(\frac{4}{100}\right)$

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

$\left(\frac{2}{10}\right)^2 = \frac{4}{100}$

$5\left(x + \frac{1}{5}\right)^2 = 5 + \frac{5(4)}{100}$

$\left(x + \frac{1}{5}\right)^2 = \frac{5}{5} + \frac{4}{100}$

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

-1

⑨ $\left(x+\frac{1}{5}\right)^2 = \frac{26}{25}$ $-\frac{14}{25}$

$x+\frac{1}{5} = \pm\sqrt{\frac{26}{25}}$ -14

$x = -\frac{1}{5} \pm \frac{\sqrt{26}}{5}$ -14

$x = \frac{-1 \pm \sqrt{26}}{5}$ -14 ← Nice use of the LCD! ☺

$x \in \left\{\frac{-1 \pm \sqrt{26}}{5}\right\}$ -14

"$\in$" uses "{}" brackets around the sol'n set.

⑩ $4x^2 - 16x + 11 = 0$

$4x^2 - 16x\left(-\frac{16}{2}\right)^2 = 4(64) - 11$

$4(x-8)^2 = -11 + 4(64)$

$x - 8 = \frac{-11}{4} + \frac{64}{4}$ -3 ← How does this... ...become this?

$x \in \left\{\frac{4 \pm \sqrt{5}}{2}\right\}$ ←

-4

-7