Writing Project 1

[redacted] MAT 121

1. $x^2 + 3x - 28 = 0$ $\frac{48.5+5}{55} \approx \frac{54}{55}$

$x = \frac{-3 \pm \sqrt{3^2 - 4 \cdot 1 \cdot (-28)}}{2 \cdot 1}$ → Do first, before plugging into the formula

$x = \frac{-3 \pm \sqrt{121}}{2}$

$x = \frac{-3 + 11}{2}$

$b^2 - 4ac = 3^2 - 4(1)(-28)$

$= 9 + 112 = 121$

$x = \frac{-3 - 11}{2}$ $x = \frac{-3 + 11}{2}$

$x = \frac{-3 \pm \sqrt{121}}{2}$

$\boxed{x = 4 \quad x = -7}$ ✓

$= \frac{-3 \pm 11}{2}$, etc

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2. $3.23x^2+21.32x-50.44=0$

$$\frac{323}{100}x^2+\frac{533}{25}x-\frac{1261}{25}=0$$

$$323x^2+2132x-5044=0$$

$$x=\frac{-2132\pm\sqrt{2132^2-4\cdot 323\cdot(-5044)}}{2\times 323}$$

$$x=\frac{-2132\pm\sqrt{2132^2+6516848}}{646}$$

$$x=\frac{-2132\pm 4\sqrt{533^2+407303}}{646}$$

fine, but no supporting work

$$x=\frac{-2132+4\sqrt{533^2+407303}}{646}$$

$$x=\frac{-1066-4\sqrt{533^2+407303}}{646}$$

Show how you're simplifying

Show scratch work.

$$x=\frac{-1066\pm 2\sqrt{533^2+407303}}{323}$$

I'm looking for your process, not for answers.

$$\boxed{x\approx 8.4489,\ x\approx 1.8483}$$

4.5

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3. $121x^2+154x+56=0$

$$x=\frac{-154\pm\sqrt{154^2-4\cdot121\cdot56}}{2\cdot121}$$

$$x=\frac{-154\pm\sqrt{23716-27104}}{242}$$

$$x=\frac{-154\pm\sqrt{-3388}}{242}$$

HOW?

4.5

$$\boxed{x=\frac{-7\pm i\sqrt{7}}{11}}$$

Show the simplification process, more explicitly. This looks like technology crutch. I need to see technique.

5. $x^2+3x-28=0$

$x^2+7x-4x-28=0$

$x\cdot(x+7)-4(x+7)=0$

$(x+7)\cdot(x-4)=0$

$x+7=0$

$x-4=0$

$\boxed{x=-7,\ x=4}$

4.9

9.5

4. $bx^2+11wx-6\pi=0$

$$\boxed{bx^2+11wx=6\pi}$$

$$x^2+\frac{11w}{b}x=\frac{6\pi}{b}$$

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$$x^2+\frac{11w}{b}x+\left(\frac{11w}{2b}\right)^2=\frac{11w^2}{4b^2}+\frac{6\pi}{b}\cdot\frac{4b}{4b}$$

$$=\frac{11w^2+24\pi b}{4b^2}$$

$$\left(x+\frac{11w}{2b}\right)^2=\frac{\pm\sqrt{11w^2+24\pi b}}{2b}$$

$$x=\frac{-11w\pm\sqrt{11w^2+24\pi b}}{2b}$$

6. $30x^2+179x-140=0$

$30x^2+200x-21x-140=0$

$10x\cdot(3x+20)-7(3x+20)=0$

$(3x+20)\cdot(10x-7)=0$

$3x+20=0$

$10x-7=0$

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$$\boxed{x=-\frac{20}{3}\quad x=\frac{7}{10}}$$

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

$x^2-5x=-5$

$x^2-5x+\left(\frac{5}{2}\right)^2=-5+\left(\frac{5}{2}\right)^2$ $= -\frac{5}{1}\cdot\frac{4}{4}+\frac{25}{4}=\frac{5}{4}$

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

$\boxed{x=\frac{-\sqrt{5}+5}{2} \quad x=\frac{\sqrt{5}+5}{2}}$

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9. $5x^2+2x+11=0$

$5x^2+2x=-11$

$x^2+\frac{2}{5}x=-\frac{11}{5}$ $\frac{2}{10}=\frac{1}{5}$!

$x^2+\frac{2}{5}x+\left(\frac{2}{10}\right)^2=-\frac{11}{5}+\left(\frac{2}{10}\right)^2$

$\left(x+\frac{2}{10}\right)^2=-\frac{54}{25}$ 4.5

$\left(x+\frac{1}{5}\right)^2=-\frac{54}{25}$ Show more steps, here

$\boxed{x=-\frac{1}{5}\pm\frac{3i\sqrt{6}}{5}}$

You simplified $\sqrt{\frac{54}{25}}$ w/o any details shown.

9.5

8. $x^2-6x-11=0$

$x^2-6x=11$ 3!

$x^2-6x+\left(\frac{6}{2}\right)^2=11+\left(\frac{6}{2}\right)^2$

$\left(x-\frac{6}{2}\right)^2=20$

$(x-3)^2=20$

$\boxed{x=-2\sqrt{5}+3 \quad x=2\sqrt{5}+3}$

4.5

$\frac{6}{2}=3 \rightsquigarrow 3^2=9$

$x^2-6x+3^2=11+9$

See how I'm doing this?

You use a whole line to go from $\frac{6}{2}$ to 3, then skip major steps, entirely. Simplify $\frac{6}{2}=3$, immediately.

10. $3x^2-4x-4=0$

$3x^2-4x=4$

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

$x^2-\frac{4}{3}x+\left(\frac{4}{6}\right)^2=\frac{4}{3}+\left(\frac{4}{6}\right)^2$

$\left(x-\frac{2}{3}\right)^2=\frac{16}{9}$

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

How?

Show detail

Show detail from $(x-3)^2=20$ to

$x=3\pm2\sqrt{5}$

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formula

quadratic equations.

The quadratic equation is reliable and will work to solve any quadratics. The downside of the quadratic equation is that it can be a rather lengthy process and has lots of places to make simple mistakes that can ruin the whole equation. If you can do it the first time with little or no

method

mistakes then quadratic is a good way to go but if the problem has a lot of big or complicated numbers that are easy to trip up on, or are hard to type into a calculator then another method may be better.

Factoring a quadratic is by far the easiest way to solve a problem and the quickest, but the downside is it may not work. Factoring sadly only works on equations that can be split into two linear equations that are equal to zero. Factoring is though by far the quickest way to solve a quadratic equation

only works when solutions are rational

Completing the square is also nice because it can solve all quadratic equations similar to the quadratic formula. Completing the square on the downside can be very tedious and take a lot more time and effort on certain equations. Completing the square is best to use if you don't know how else to solve a quadratic equation and need to be sure of the answer.

is the most efficient way, if your arithmetic & algebra are strong.

OK

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