aka "Jeremy"

Algebra 2 // Practice 3

1 $x - 2y - 3z = 1$

$y - 3z = -10$

$2z = 6$

$\frac{2z}{2} = \frac{6}{2}$

$z = 3$

$y - 3(3) = -10$

$y - 9 = -10$

$+9 \quad +9$

$y = -1$

$x - 2y - 3z = 1$

$x - 2(-1) - 3(3) = 1$

$x + 2 - 9 = 1$

$x - 7 = 1$

$+7 \quad +7$

$x = 8$

$(8, -1, 3)$

2 $z = 7$

$y + 2z = 17$

$x - 3y - 4z = -32$

$y + 2(7) = 17$

$y + 14 = 17$

$-14 \quad -14$

$y = 3$

$x - 3y - 4z = -32$

$x - 3(3) - 4(7) = -32$

$x - 9 - 28 = -32$

$x - 37 = -32$

$+37 \quad +37$

$x = 3$

$(3, 3, 7)$

3 $2x - 3y + z = -4$

$2y + 3z = 9$

$-2z = -2$

$\frac{-2z}{-2} = \frac{-2}{-2}$

$z = 1$

$2y + 3(1) = 9$

$2y + 3 = 9$

$-3 \quad -3$

$\frac{2y}{2} = \frac{6}{2}$

$y = 3$

$2x - 3(3) + (1) = -4$

$2x - 9 + 1 = -4$

$2x - 8 = -4$

$+8 \quad +8$

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

$(2, 3, 1)$

Hints for 1-3:

↳ these are pretty straight forward. You can quickly solve for one variable. Plug in, and get second. Plug in both to get the last.

4

① $4x + 2y = 12$

② $-x + z = -2$

③ $y + z = -4$

② $-x + z = -2$

③ $-1(y + z = -4)$

$-y - z = 4$

$-x + z = -2$

④ $-x - y = 2$

① $4x + 2y = 12$

④ $4(-x - y = 2)$

$-4x - 4y = 8$

$4x + 2y = 12$

$-2y = 20$

$\frac{-2y}{-2} = \frac{20}{-2}$

$y = -10$

③ $y + z = -4$

$-10 + z = -4$

$+10 \quad +10$

$z = 6$

② $-x + z = -2$

$-x + 6 = -2$

$-6 \quad -6$

$-x = -8$

$\frac{-x}{-1} = \frac{-8}{-1}$

$x = 8$

$(8, -10, 6)$

5

① $2x - 5y = 23$

② $x - z = 9$

③ $y + z = -8$

② $x - z = 9$

③ $y + z = -8$

④ $x + y = 1$

① $2x - 5y = 23$

④ $5(x + y = 1)$

$5x + 5y = 5$

$2x - 5y = 23$

$7x = 28$

$\frac{7x}{7} = \frac{28}{7}$

$x = 4$

② $x - z = 9$

$4 - z = 9$

$-4 \quad -4$

$-z = 5$

$\frac{-z}{-1} = \frac{5}{-1}$

$z = -5$

③ $y + z = -8$

$y + -5 = -8$

$+5 \quad +5$

$y = -3$

$(4, -3, -5)$

6

① $3x + 2y = 4$

② $2x - 6z = -14$

③ $y + 3z = 8$

② $2x - 6z = -14$

③ $2(y + 3z = 8)$

$2y + 6z = 16$

$2x - 6z = -14$

④ $2x + 2y = 2$

$3x + 2y = 4$

$-1(2x + 2y = 2)$

$-2x - 2y = -2$

$3x + 2y = 4$

$x = 2$

② $2x - 6z = -14$

$2(2) - 6z = -14$

$4 - 6z = -14$

$-4 \quad -4$

$-6z = -18$

$-6 \quad -6$

$z = 3$

③ $y + 3z = 8$

$y + 3(3) = 8$

$y + 9 = 8$

$-9 \quad -9$

$y = -1$

$(2, -1, 3)$

Hints for 4-6

↳ These are the most missed questions on the exam. Choose two and eliminate. This new equation should be cancelled with the last equation not used yet. Then plug back in.

7 ① $3(2x + 6y - 4z = 8) \rightarrow 6x + 18y - 12z = 24$ ①

② $2(3x + 10y - 7z = 12) \rightarrow 6x + 20y - 14z = 24$ ②

③ $3(-2x - 6y + 5z = -3) \rightarrow -6x - 18y + 15z = -9$ ③

↙ ↘

① $6x + 18y - 12z = 24$
③ $-6x - 18y + 15z = -9$

④ $3z = 15$

$\frac{3z}{3} = \frac{15}{3}$

$z = 5$

② $6x + 20y - 14z = 24$
③ $-6x - 18y + 15z = -9$

⑤ $2y + z = 15$

$2y + (5) = 15$

$2y + 5 = 15$

$-5 \quad -5$

$\frac{2y}{2} = \frac{10}{2} \rightarrow y = 5$

$2x + 6y - 4z = 8$

$2x + 6(5) - 4(5) = 8$

$2x + 30 - 20 = 8$

$2x + 10 = 8$

$-10 \quad -10$

$\frac{2x}{2} = \frac{-2}{2} \rightarrow x = -1$

$(-1, 5, 5)$

8 $2x - y + 3z = 8$

$2(x - 6y - z = 0) \rightarrow 2x - 12y - 2z = 0$

$-2x + y - 3z = 8$

$2x - y + 3z = 8$
$-2x + y - 3z = 8$

$0 = 16$

↳ ? this is not true

$2x - 12y - 2z = 0$
$-2x + y - 3z = 8$

remember:
not true = no sol.
true = ∞ many

↳ dh

↳ no solution

9

① $2(-x+y-3z=-4) \rightarrow -2x+2y-6z=-8$

② $3x-2y+8z=14$

③ $2x-2y+5z=7$

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① $-2x+2y-6z=-8$ ② $3x-2y+8z=14$

④ $x+2z=6$

① $-2x+2y-6z=-8$ ③ $2x-2y+5z=7$

⑤ $\frac{-z}{-1}=\frac{-1}{-1} \rightarrow z=1$

↳ $x+2(1)=6$

$x+2=6$

$-2 \quad -2$

$x=4$

→ $-x+y-3z=-4$

$-(4)+y-3(1)=-4$

$-4+y-3=-4$

$y-7=-4$

$+7 \quad +7$

$y=3$

$(4,3,1)$

10

$x-2y+3z=-1$ $\quad 6(x-2y+3z=-1)$

$2+2x=-6z+4y \rightarrow -3(2x-4y+6z=-2)$

$3x-6y+9z=-3$ $\quad -2(3x-6y+9z=-3)$

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① $6x-12y+18z=-6$

② $6x-12y+18z=-6$

③ $-6x+12y-18z=6$

① $6x-12y+18z=-6$

③ $-6x+12y-18z=6$

$0=0$

② $6x-12y+18z=-6$

③ $-6x+12y-18z=6$

$0=0$

↳ True

Same line → ∞ many solutions

"thought cloud"

$2+2x=-6z+4y$

$+6z \quad -4y \quad -2$

$2x-4y+6z=-2$

← red flag

two are identical and one has opposite signs...

11 ① $2(x + y + z = -4) \rightarrow 2x + 2y + 2z = -8$ ①

② $2(2x - 3y + z = 17) \rightarrow 4x - 6y + 2z = 34$ ②

③ $x + 2y - 2z = -9 \rightarrow x + 2y - 2z = -9$ ③

① $2x + 2y + 2z = -8$

③ $x + 2y - 2z = -9$

④ $3x + 4y = -17$

② $4x - 6y + 2z = 34$

③ $x + 2y - 2z = -9$

⑤ $5x - 4y = 25$

④ $3x + 4y = -17$

⑤ $5x - 4y = 25$

$8x = 8 \rightarrow x = 1$

$5x - 4y = 25$

$5(1) - 4y = 25$

$5 - 4y = 25$

$-5 \quad -5$

$-4y = 20 \rightarrow y = -5$

$x + 2y - 2z = -9$

$(1) + 2(-5) - 2z = -9$

$1 - 10 - 2z = -9$

$-9 - 2z = -9$

$+9 \quad +9$

$-2z = 0 \rightarrow z = 0$

$(1, -5, 0)$

12 $-2(x + y - 2z = 5) \rightarrow -2x - 2y + 4z = -10$ ①

$2(x + 2y + z = 8) \rightarrow 2x + 4y + 2z = 16$ ②

$2x + 3y - z = 13$ $2x + 3y - z = 13$ ③

① $-2x - 2y + 4z = -10$

② $2x + 4y + 2z = 16$

④ $2y + 6z = 6$

① $-2x - 2y + 4z = -10$

③ $2x + 3y - z = 13$

⑤ $y + 3z = 3$

$2y + 6z = 6 \rightarrow 2y + 6z = 6$

$-2(y + 3z = 3) \rightarrow -2y - 6z = -6$

$0 = 0$

True

→ same line

∞ many solutions

13 $-2(x + y - 2z = 5) \rightarrow -2x - 2y + 4z = -10$ ①

$-2(x + 2y + z = 8) \rightarrow -2x - 4y - 2z = -16$ ②

$2x + 3y - z = 1$ ③

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① $-2x - 2y + 4z = -10$

③ $2x + 3y - z = 1$

---

④ $y + 3z = -9$

② $-2x - 4y - 2z = -16$

③ $2x + 3y - z = 1$

---

⑤ $-y - 3z = -15$

④ $y + 3z = -9$

⑤ $-y - 3z = -15$

$0 = -24$

↳ Not True

No Solutions

Hints

↳ (1) Take your time!

(2) Stay organized

(3) Be careful of simple mistakes, like negatives...