

TMT V3 First 20 Algebra Prep

1. Find the slope if given two points, (-2, 6)

and (4, 8) [210]

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{8 - 6}{4 - (-2)} = \frac{2}{6} = \frac{1}{3}$$

2. Multiply $(x - 4)^2$ [61]

$$(x - 4)(x - 4) = x^2 - 8x + 16$$

3. Solve $|x - 3| = 17$ [84]

$$\begin{aligned} x - 3 &= 17 & x - 3 &= -17 \\ +3 &+3 & +3 &+3 \\ \hline x &= 20 & x &= -14 \end{aligned}$$

4. Evaluate $f(x) = -3x^2 - x$ if $x = -1$

[110] $f(-1) = -3(-1)^2 - (-1)$
 $f(-1) = -3 \cdot 1 + 1$
 $f(-1) = -2$

5. Simplify $\frac{-3 \pm 3\sqrt{2}}{6}$ [214] *Factor it if you can*

$$\frac{3(-1 \pm \sqrt{2})}{3 \cdot 2} = \frac{-1 \pm \sqrt{2}}{2}$$

6. Solve. Show 3+ steps of work [89]

$$\begin{aligned} -2 - (2x - 1) &= 3x + 9 \\ -2 - 2x + 1 &= 3x + 9 \\ -1 - 2x &= 3x + 9 \\ +2x &+2x \\ \hline -1 &= 5x + 9 \\ -9 &-9 \\ \hline -10 &= 5x \\ \frac{-10}{5} &= \frac{5x}{5} & x &= -2 \end{aligned}$$

7. Simplify $\frac{7x^2}{35x^8}$ [24]

$$\frac{7 \cdot \cancel{x} \cdot \cancel{x}}{7 \cdot 5 \cdot \cancel{x} \cdot \cancel{x} \cdot x^6} = \frac{1}{5x^6}$$

8. Simplify $\frac{2}{5} \cdot \frac{7}{3}$ [50]

$$\frac{2}{5} \cdot \frac{7}{3} = \frac{14}{15}$$

9. Factor out a GCF $2x^2 - 14x + 20$ [58]

$$2x(x - 7 + 10)$$

10. Simplify $(3a^2b^4)^2 \cdot b^5$ [206]

$$9a^4b^8 \cdot b^5 = 9a^4b^{13}$$

11. Find the following: $8y = 16x - 8$ [135]

Slope: 2
 Y-Intercept: (0, -1)
 or $y = -1$

12. Solve $(3x + 1)(x - 9) = 0$ [85]

$$\begin{aligned} 3x + 1 &= 0 & x - 9 &= 0 \\ -1 &-1 & +9 &+9 \\ \hline 3x &= -1 & x &= 9 \\ x &= -\frac{1}{3} & & \end{aligned}$$

13. Solve $-2n + 7 < -3$ [82]

$$\begin{aligned} -2n + 7 &< -3 \\ -7 &-7 \\ \hline -2n &< -10 \\ \frac{-2n}{-2} &< \frac{-10}{-2} & n &> 5 \end{aligned}$$

Sign switch when \div or \times by a negative

14. Simplify $\frac{4}{7} \cdot \frac{21}{8}$ [42]

$$\frac{4}{\cancel{7}} \cdot \frac{\cancel{21}^3}{4 \cdot 2} = \frac{3}{2}$$

15. Solve $x^2 - 3x - 2 = 3$ [88]

$$\frac{3 \pm \sqrt{29}}{2}$$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
 $a = 1, b = -3, c = -5$
 $\frac{-(-3) \pm \sqrt{(-3)^2 - 4(1)(-5)}}{2(1)}$

16. Simplify $\frac{(x-7)(x+3)}{(x-7)(x+7)}$ [209]

$$\frac{x+3}{x+7}$$

17. Simplify $\frac{2}{7} + \frac{5}{3}$ [39]

$$\frac{3 \cdot 2}{3 \cdot 7} + \frac{5 \cdot 7}{3 \cdot 7} = \frac{6}{21} + \frac{35}{21} = \frac{41}{21}$$

18. Multiply $(2x - 9)(x + 1)$ [60]

$$2x^2 + 2x - 9x - 9 = 2x^2 - 7x - 9$$

19. Factor $x^2 - x - 6$ [53] $(x+2)(x-3)$

20. Simplify (PEMDAS) $2(5 - 2(x + 1))$ [121]

$$\begin{aligned} 2(5 - 2x - 2) \\ 2(3 - 2x) \\ 6 - 4x \\ -4x + 6 \end{aligned}$$