

TMT V1 First 20 Algebra Prep

1. Multiply $(x+5)^2$ [51]

$$(x+5)(x+5) = x^2 + 5x + 5x + 25 = x^2 + 10x + 25$$

2. Factor $x^2 - 7x - 8$ [53]

$$(x+1)(x-8)$$

3. Solve $(3x+1)(x-4) = 0$ [85]

$$\begin{aligned} 3x+1 &= 0 & x-4 &= 0 \\ 3x &= -1 & x &= 4 \\ x &= -\frac{1}{3} & & \end{aligned}$$

4. Simplify $\frac{2}{3} + \frac{4}{5}$ [39]

$$\frac{5 \cdot 2}{5 \cdot 3} + \frac{4 \cdot 3}{5 \cdot 3} = \frac{10}{15} + \frac{12}{15} = \frac{22}{15}$$

5. Simplify $\frac{2}{3} \cdot \frac{2}{5}$ [42]

$$\frac{2 \cdot 2}{3 \cdot 5} = \frac{4}{15}$$

6. Find the following: $2y = 4x + 6$ [135]

Slope: 2
Y-Intercept: $y = 3$ or $(0, 3)$
 $y = 2x + 3$

7. Multiply $(2x-5)(x+4)$ [60]

$$2x^2 + 8x - 5x - 20 = 2x^2 + 3x - 20$$

8. Simplify $\frac{5x^3}{15x^4}$ [74]

$$\frac{5 \cdot x \cdot x \cdot x}{15 \cdot 3 \cdot x \cdot x \cdot x} = \frac{x^2}{3}$$

9. Simplify $\frac{3}{4} \cdot \frac{9}{4}$ [50]

$$\frac{3}{4} * \frac{9}{4} = \frac{27}{16}$$

10. Simplify (PEMDAS) $2(3 + 2(x+1))$ [112]

$$2(3 + 2x + 2) = 2(2x + 5) = 4x + 10$$

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

$$25a^6 \cdot b^8 \cdot b^2 = 25a^6 \cdot b^{10}$$

12. Simplify $\frac{-3 \pm 3\sqrt{2}}{3}$ [214] ← factor $3(-1 \pm \sqrt{2})$

$$-1 \pm \sqrt{2}$$

13. Solve $|x+3| = 7$ [84]

$$\begin{aligned} x+3 &= 7 & x+3 &= -7 \\ x &= 4 & x &= -10 \end{aligned}$$

14. solve $-2n + 1 > -5$ [82]

$$\begin{aligned} -2n &> -6 \\ n &< 3 \end{aligned}$$

NOTE: Sign Switched when \times or \div by a negative

15. Solve $x^2 + x - 1 = 2$ [88]

$$x^2 + x - 3 = 0 \quad x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

16. Simplify $\frac{(x-5)(x+7)}{x^2 - 25}$ [209]

$$\frac{(x-5)(x+7)}{(x-5)(x+5)} = \frac{-1 \pm \sqrt{1^2 - 4(1)(-3)}}{2(1)} = \frac{-1 \pm \sqrt{1+12}}{2} = \frac{-1 \pm \sqrt{13}}{2}$$

17. Evaluate $f(x) = 2x^2 - 6$ if $x = -1$ [110]

$$\begin{aligned} f(-1) &= 2(-1)^2 - 6 \\ f(-1) &= 2 - 6 \\ f(-1) &= -4 \end{aligned}$$

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

and $(4, 8)$ [210]

$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{8 - (-2)}{4 - 1} = \frac{10}{3}$$

19. Factor out the gcf $2x^2 + 4ax - 2x$ [58]

$$2x(x + 2a - 1)$$

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

$$\begin{aligned} 3 - (2x + 5) &= 4x + 7 \\ 3 - 2x - 5 &= 4x + 7 \\ -2x - 2 &= 4x + 7 \\ +2x & \quad +2x \\ \hline -2 &= 6x + 7 \\ -7 & \quad -7 \\ \hline -9 &= 6x \\ \frac{-9}{6} &= \frac{6x}{6} \\ x &= \frac{-9}{6} = \frac{-3 \cdot 3}{2 \cdot 3} = \left(\frac{-3}{2}\right) \text{ or } -1.5 \end{aligned}$$