

No Calculator - 20 Minutes Timed

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KEY

Hour: \_\_\_\_\_

TMT V1 Top 20 Algebra Prep

1. Multiply  $(x^2 - 5x + 3)(x - 5)$  [213]

$$x^3 - 5x^2 - 5x^2 + 25x + 3x - 15$$

$$x^3 - 10x^2 + 28x - 15$$

2. Find the midpoint given (6,2) & (4,10)

$$\left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$\left( \frac{6+4}{2}, \frac{2+10}{2} \right) = (5, 6)$$

3. Solve  $4x^2 - 14x - 8 = 0$  [85]

$$2(2x^2 - 7x - 4) = 0$$

$$2(2x+1)(x-4) = 0$$

$$2x+1=0 \quad x=-\frac{1}{2} \quad x-4=0$$

$$2x=-1 \quad x=-\frac{1}{2} \quad x=4$$

4. Simplify  $\frac{10}{3} \cdot \frac{4}{5}$  [42]

$$\frac{10 \cdot 4}{3 \cdot 5} = \frac{40}{15} = \frac{8}{3}$$

5. Solve  $(x-3)^2 = 7$  [208]

$$|x-3| = \sqrt{7}$$

$$x-3 = \sqrt{7} \quad x-3 = -\sqrt{7}$$

$$x = 3 + \sqrt{7} \quad x = 3 - \sqrt{7}$$

6. Solve  $P = 2l + 2w$  for  $w$  [205]

$$P - 2l = 2w$$

$$\frac{P-2l}{2} = w$$

$$w = \frac{P-2l}{2}$$

7. Simplify (PEMDAS)  $3(x+2)^2 + 3$  [212]

$$3(x^2 + 4x + 4) + 3$$

$$3x^2 + 12x + 12 + 3 = 3x^2 + 12x + 15$$

8. Simplify  $(2a^3b^4)^2 \cdot 8(a^5b^2)$  [206]

$$4a^6b^8 \cdot 8a^5b^2$$

$$32a^{11}b^{10}$$

9. Clear fractions, solve  $\frac{2}{3}a + 3 = \frac{1}{5}$  [207]

$$3 \cdot 5 \cdot \frac{2}{3}a + 3 \cdot 5 = \frac{1}{5} \cdot 3 \cdot 5$$

$$10a + 15 = 3$$

$$10a = -12$$

$$a = \frac{-12}{10} = \frac{-6}{5}$$

10. Simplify  $\frac{x^2+2x-35}{x^2-25}$  [209]

$$\frac{(x+7)(x-5)}{(x+5)(x-5)} = \frac{x+7}{x+5}$$

11. Given  $f(x) = 2x^2 + 3x - 6$ , find  $f(-1)$

$$f(-1) = 2(-1)^2 + 3(-1) - 6$$

$$f(-1) = 2 - 3 - 6$$

$$f(-1) = -1 - 6$$

$$f(-1) = -7$$

12. Simplify  $\frac{5x^2y}{10x^6}$  [74]

$$\frac{5 \cdot x \cdot x \cdot y}{5 \cdot 2 \cdot x \cdot x \cdot x^4} = \frac{y}{2x^4}$$

13. Simplify  $(2x+5a)^2$  [211]

$$(2x+5a)(2x+5a)$$

$$4x^2 + 10ax + 10ax + 25a^2$$

$$4x^2 + 20ax + 25a^2$$

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

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

15. Find the distance between (1,3) & (-2,5)

$$d = \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2}$$

$$d = \sqrt{(-2-1)^2 + (5-3)^2}$$

$$d = \sqrt{9 + 4} = \sqrt{13}$$

16. Find 3 points on  $f(x) = 2x^2 + x - 4$

$$2(0)^2 + (0) - 4$$

X	Y
0	-4
1	-1
2	6

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

$$2(3x-2) - (x+5) = 4x+7$$

$$6x-4-x-5 = 4x+7$$

$$5x-9 = 4x+7$$

$$-4x-9 = 7$$

$$-4x = 16$$

$$x = -4$$

18. Simplify  $\frac{-3\sqrt{27}}{3}$  [214]

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

19. Simplify  $\frac{2}{3} + 2\frac{4}{5}$  [222]

$$\frac{2}{3} + \frac{14}{5} = \frac{10}{15} + \frac{42}{15} = \frac{52}{15}$$

20. Write an equation using (2,4) & (-4,7)

$$\text{Slope} = m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{7-4}{-4-2} = \frac{3}{-6} = -\frac{1}{2}$$

$$y - y_1 = m(x - x_1)$$

$$y - 7 = -\frac{1}{2}(x + 4) \quad \text{or} \quad y - 4 = -\frac{1}{2}(x - 2) \quad \text{or} \quad y = \frac{1}{2}x + 5$$