

Mathematics Placement Test - Answer Key
Practice Problems
Section I

The following questions are a sample of the types of problems you might see on the Mathematics Placement Test. **Calculators are not permitted for the test.**

1. Express $\frac{5}{2} \times \left(\frac{1}{11} - \frac{1}{2} \right)$ as a single fraction. **ANSWER** $-\frac{45}{44}$

2. Is $\frac{3}{5} < \frac{2}{3} < \frac{8}{14}$ true? **ANSWER** No

3. Factor the expression $3x^2 + 5x - 2$. **ANSWER** $(3x - 1)(x + 2)$

4. Simplify the expression $\sqrt{\frac{18x^5}{z^2}}$. **ANSWER** $\frac{3x^2}{z}\sqrt{2x}$

5. Expand $4(s + 2)$. **ANSWER** $4s + 8$

6. If $x - 1 = 2$, then what is $x + 1$? **ANSWER** 4

7. If $x = 3$, then what is $x^2 + 3$? **ANSWER** 12

8. Simplify the expression $13a - 15b - a + 2b$. **ANSWER** $12a - 13b$

9. If $x = -4$ and $y = -7$, then what is $x - y$? **ANSWER** 3

10. Simplify $\frac{(-2)(-6)}{-4}$. **ANSWER** -3
11. Simplify $4 - (-2 + 5)$. **ANSWER** 1
12. Simplify $(10) \left(\frac{1}{5}\right) (-2)(3)$. **ANSWER** -12
13. Solve for p in the following inequality: $3p > p + 12$. **ANSWER** $p > 6$
14. Simplify the following expression $(2x + 3) - (x - 2)$. **ANSWER** $x + 5$
15. If $\frac{1}{3}$ of a number is 8, then what is $\frac{1}{4}$ of the number? **ANSWER** 6
16. Given that $ax + b = 3$ and $a \neq 0$, solve for x . **ANSWER** $x = \frac{3 - b}{a}$
17. Simplify $\frac{2x}{3y} \cdot \frac{9y}{4x^2}$. **ANSWER** $\frac{3}{2x}$
18. Determine the slope of the line that passes through the points $(1, 1)$ and $(-3, -2)$. **ANSWER** $\frac{3}{4}$
19. Factor the expression $2x^2 - 7x + 6$. **ANSWER** $(2x - 3)(x - 2)$
20. Factor the expression $x^2 - 81$. **ANSWER** $(x + 9)(x - 9)$
21. Simplify $(-2x^2)(3x^2y)(-y)$. **ANSWER** $6x^4y^2$

22. Simplify $(2x^5y^2)^2$. **ANSWER** $4x^{10}y^4$
23. Simplify $\frac{y}{x^3} \div \frac{y^3}{x}$. **ANSWER** $\frac{1}{x^2y^2}$
24. If the sum of three numbers is 65 and one of the numbers is x , what is the sum of the other two? **ANSWER** $65 - x$
25. Factor the expression $x^2 + x - 12$. **ANSWER** $(x - 3)(x + 4)$
26. Factor the expression $xy^4 + yx^4$. **ANSWER** $xy(y^3 + x^3)$
27. Determine all the x -values that are solutions to $x^2 + x - 1 = 0$.
ANSWER $\frac{-1 \pm \sqrt{5}}{2}$
28. If $5(2x + 3) - (x + 3) = 0$, then what is x ? **ANSWER** $x = -\frac{4}{3}$
29. Expand $(2m + 3)^2$. **ANSWER** $4m^2 + 12m + 9$
30. The average of x , y and z is 80. If two of the numbers are 74 and 78, then what is the other number? **ANSWER** 88
31. Simplify the expression $4^2 + 4^0$. **ANSWER** 17
32. Simplify $\sqrt{64x^{16}}$. **ANSWER** $8x^8$
33. Simplify $\frac{6}{7} - \frac{1}{3}$. **ANSWER** $\frac{11}{21}$

34. Simplify $\frac{5}{7} \div \left(\frac{5}{9} + \frac{1}{7}\right)$. **ANSWER** $\frac{45}{44}$
35. Simplify $19.27 - 14.539$. **ANSWER** 4.731
36. Simplify $(6.38)(0.542)$. **ANSWER** 3.458
37. Simplify $\frac{15M^2 + 5M}{5M}$. **ANSWER** $3M + 1$
38. Simplify $\frac{7}{3} \times \frac{1}{2}$. **ANSWER** $\frac{7}{6}$
39. Evaluate $x^2y - 2xy - y^2$ when $x = -3$ and $y = -4$. **ANSWER** -76
40. Solve for x in the equation $5x - 10 = 2 - 2x$. **ANSWER** $x = \frac{12}{7}$
41. Solve for x in the equation $x^2 - 1 = 0$. **ANSWER** $x = \pm 1$
42. Solve for x in the inequality $1 - 5x < 3 + x$. **ANSWER** $x > -\frac{1}{3}$
43. Solve for x in the equation $\frac{5}{10} = \frac{15}{x}$. **ANSWER** $x = 30$
44. Perform the indicated operation and simplify the expression $3x - (5x - 4)$.
ANSWER $-2x + 4$
45. Perform the indicated operation and simplify the expression $(x^2 - 2x + 2) - (4x^2 - 8x - 3)$. **ANSWER** $-3x^2 + 6x + 5$

46. Expand the expression $(4x - 5)(3x + 2)$. **ANSWER** $12x^2 - 7x - 10$

47. Solve for x in the equation $x^2 - 3x + 1 = 0$. **ANSWER** $x = \frac{3 \pm \sqrt{5}}{2}$

48. Solve for a and b in the linear system

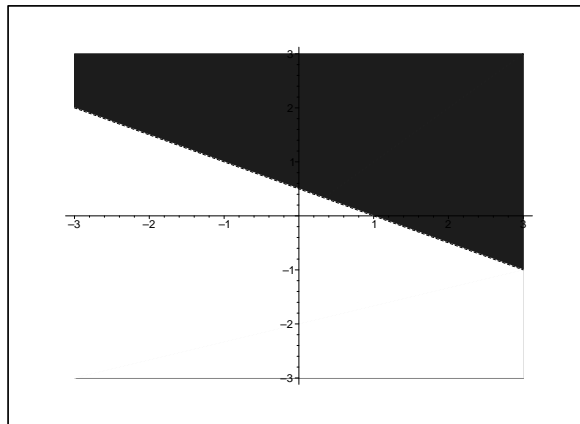
$$3a + b = 3,$$

$$a - 2b = 1.$$

ANSWER $a = 1; b = 0$

49. Shade the region of the xy -plane described by $\{(x, y) \mid x + 2y \geq 1\}$.

ANSWER Shaded region below



50. Determine the equation for the line with slope $1/3$ that passes through the point $(3, -2)$. **ANSWER** $\frac{1}{3}x - 3$