

**INTERMEDIATE ALGEBRA – MAT 1033
PRACTICE EXAM**

Name _____

Form WC

Directions: Choose the **one best** answer for each item.

1. Simplify:
$$\frac{7(-3-2) - 4(-6) - 2(-3)}{3(-4) + 5(2)}$$

- A. $\frac{2}{5}$ B. $\frac{5}{2}$ C. $-\frac{5}{2}$ D. $\frac{5}{4}$

2. Solve:
$$\frac{4r-3}{5} - \frac{7r-1}{6} = \frac{6}{5}$$

- A. $-\frac{49}{11}$ B. $-\frac{59}{11}$ C. $-\frac{19}{11}$ D. -5

3. A person invests some money at 14%, with \$8000 more than this amount invested at 12%. The total annual income from the investments is \$9280. How much is invested at 14%?

- A. \$40,000 B. \$32,000 C. \$25,000 D. \$36,000

4. Simplify:
$$\frac{p^{6q} \cdot p^{8q-1}}{p^{3-q}}$$

- A. p^{4-13q} B. p^{13q+4} C. p^{13q-4} D. p^{15q-4}

5. Simplify:
$$\frac{2^{-4} \cdot k^{-1} \cdot (k^{-2})^3}{4^{-1} \cdot (k^3)^{-1}}$$

- A. $\frac{4}{k^4}$ B. $\frac{1}{4k^4}$ C. $\frac{k^4}{4}$ D. $4k^4$

6. Solve: $|3x-4|+7=16$

- A. $\frac{13}{3}$ B. $\left\{\frac{13}{3}, -\frac{19}{3}\right\}$ C. $\left\{\frac{13}{3}, -\frac{13}{3}\right\}$ D. $\left\{\frac{13}{3}, -\frac{5}{3}\right\}$

7. Solve. Express your answer in interval notation. $|5x+2| \leq 7$

- A. $\left[-\frac{9}{5}, 1\right]$ B. $(-\infty, 1]$ C. $\left(-\infty, -\frac{9}{5}\right] \cup [1, \infty)$ D. $\left(-\infty, -\frac{9}{5}\right]$

8. Perform the indicated operations. $(7a^2 - 3a) - [(2a^2 - 4a) + (3a^2 + 6)]$

- A. $8a^2 + a + 6$ B. $2a^2 - 5a + 6$ C. $2a^2 - 7a - 6$ D. $2a^2 + a - 6$

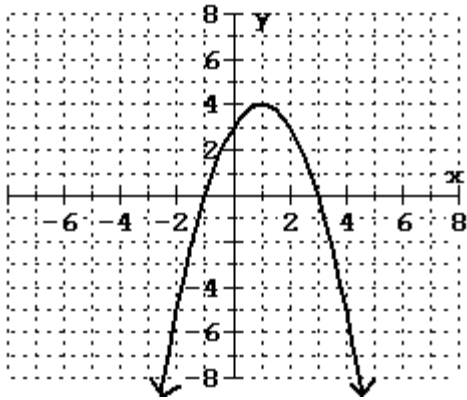
9. Factor completely: $3p - 3q - px + qx$
 A. $3(p - q) - x(p + q)$ B. $3(p - q) - x(p - q)$ C. $(p - q)(3 - x)$ D. $(p - q)(3 + x)$
10. Factor completely: $8a^3 + 125b^3$
 A. $(2a + 5b)(4a^2 - 10ab + 25b^2)$ B. $(2a + 5b)(4a^2 + 10ab + 25b^2)$
 C. $(2a + 5b)(4a^2 - 20ab + 25b^2)$ D. $(2a - 5b)(4a^2 + 10ab + 25b^2)$
11. Find the solution set: $21k^2 + 4 = 19k$
 A. $\left\{-\frac{4}{7}, -\frac{1}{3}\right\}$ B. $\left\{\frac{4}{7}, -\frac{1}{3}\right\}$ C. $\left\{-\frac{4}{7}, \frac{1}{3}\right\}$ D. $\left\{\frac{4}{7}, \frac{1}{3}\right\}$
12. The difference of a number and its reciprocal is $\frac{15}{4}$. What is the number?
 A. $-\frac{1}{4}$ or 4 B. 4 C. $-\frac{1}{4}$ D. $\frac{1}{4}$ or -4
13. For what values of x , if any, is this expression undefined: $\frac{x+3}{x^2-8x+7}$
 A. 1, 7 B. -3, -1, -7 C. -3, 1, 7 D. -1, -7
14. Simplify: $\frac{\frac{1}{x^2} - \frac{1}{y^2}}{\frac{1}{x} - \frac{1}{y}}$
 A. $\frac{1}{x+y}$ B. $\frac{1}{x-y}$ C. $\frac{y-x}{xy}$ D. $\frac{y+x}{xy}$
15. Find the solution set: $x^2 - 2x + 13 = 0$
 A. $\{-1 + 2i\sqrt{3}, -1 - 2i\sqrt{3}\}$ B. $\{4i\sqrt{3}, -4i\sqrt{3}\}$
 C. $\{1 + 2i\sqrt{3}, 1 - 2i\sqrt{3}\}$ D. $\left\{\frac{2 + \sqrt{56}}{2}, \frac{2 - \sqrt{56}}{2}\right\}$
16. Divide: $\frac{x^3 - 4x^2 + x + 6}{x+1}$
 A. $x^2 - 3x - 2 + \frac{4}{x+1}$ B. $x^2 - 5x - 4 + \frac{10}{x+1}$
 C. $x^2 - 5x + 6$ D. $x^2 - 5x - 4 + \frac{2}{x+1}$

17. Find the solution set: $\frac{2}{k} + \frac{1}{k+3} = \frac{6}{5}$
- A. $\left\{-2, \frac{5}{2}\right\}$ B. $\left\{2, -\frac{5}{2}\right\}$ C. $\left\{-2, -\frac{5}{2}\right\}$ D. $\left\{2, \frac{5}{2}\right\}$
18. One printer can print the paychecks for the employees of a company in 54 minutes. A second printer can print the checks in 81 minutes. How long would it take to print the checks with both printers operating?
- A. 45 min. B. 32.4 min. C. 28.5 min. D. 67.5 min.
19. Simplify: $\left(\frac{-32}{243}\right)^{3/5}$
- A. $\frac{27}{8}$ B. $-\frac{8}{27}$ C. $-\frac{27}{8}$ D. $\frac{8}{27}$
20. Add. Simplify the answer. $\frac{3}{y^2-3y+2} + \frac{5}{y^2-1}$
- A. $\frac{7y-8}{(y-1)(y+1)(y-2)}$ B. $\frac{30y-7}{(y-1)(y+1)(y-2)}$
- C. $\frac{8y-7}{(y-1)(y-2)}$ D. $\frac{8y-7}{(y-1)(y+1)(y-2)}$
21. List all the elements of T that belong to the set of natural numbers.
- $T = \left\{2, \sqrt{6}, -17, 0, \frac{1}{3}, -3, 2.8, \sqrt{16}\right\}$
- A. 2, 0, $\sqrt{16}$ B. 2, $\sqrt{16}$ C. 2, 0 D. -17, 0, 2
22. Solve: $P = 2l + 2w$, for w .
- A. $w = P - l$ B. $w = \frac{P+2}{2}$ C. $w = P + l$ D. $w = \frac{P-2l}{2}$
23. Multiply: $y^{-5/8} (y^{13/8} - y^{-3/8})$
- A. $y^{9/4} - y^{1/4}$ B. $y^{9/4} + y^{1/4}$ C. $y + y^{-1}$ D. $y - \frac{1}{y}$

24. Simplify. Assume that all variables represent positive real numbers. $7\sqrt{48x^3} - 8x\sqrt{108x}$
- A. $20x\sqrt{3x}$ B. $-20x\sqrt{12x}$ C. $-20x\sqrt{3x}$ D. $-80x\sqrt{3x}$
25. Multiply: $(\sqrt{2} - \sqrt{5})(2\sqrt{2} + 3\sqrt{5})$
- A. $11 + \sqrt{10}$ B. $-11 - \sqrt{10}$ C. $11 - \sqrt{10}$ D. $\sqrt{10} - 11$
26. Find the solution set: $p = \sqrt{3p + 10}$
- A. $\{-2, 5\}$ B. $\{5\}$ C. $\{-2\}$ D. $\{ \}$
27. Find the solution set: $(x - 9)^2 = -49$
- A. $\{-9 + 7i, -9 - 7i\}$ B. $\{16, 2\}$ C. $\{-16, -2\}$ D. $\{9 + 7i, 9 - 7i\}$
28. Find the solution set: $\sqrt{x - 2} = x - 4$
- A. $\{3, 6\}$ B. $\{-3, -6\}$ C. $\{2\}$ D. $\{6\}$
29. Rationalize the denominator: $\sqrt[3]{\frac{3x}{2y^2}}$
- A. $\sqrt[3]{6x}$ B. $\frac{\sqrt[3]{6x}}{2y}$ C. $\frac{\sqrt[3]{12xy}}{2y}$ D. $\frac{\sqrt[3]{6xy^2}}{2y^2}$
30. Find the length of the diagonal of a rectangle with a width of 16 inches and a length of 12 inches.
- A. 29 in. B. 20 in. C. $5\sqrt{5}$ in. D. 5 in.
31. Find the solution set: $y^2 - 4y + 13 = 0$
- A. $\{2 + 3i, 2 - 3i\}$ B. $\{-2 + 3i, -2 - 3i\}$ C. $\{2 + 9i, 2 - 9i\}$ D. $\{-2 + 9i, -2 - 9i\}$
32. Find the slope and y-intercept of the line with equation $2y - 5x = 6$.
- A. $m = \frac{2}{5}; b = 3$ B. $m = \frac{5}{2}; b = 3$ C. $m = -\frac{5}{2}; b = -3$ D. $m = -5; b = 6$

33. Find the equation of the line perpendicular to $4x - 5y = 3$ through $(2, -3)$.
- A. $y = -\frac{5}{4}x - \frac{1}{2}$ B. $y = -\frac{4}{5}x - \frac{7}{5}$ C. $y = \frac{4}{5}x - \frac{23}{5}$ D. $y = \frac{5}{4}x - \frac{11}{2}$
34. Find the equation of the line through $(-2, -4)$ and $(-4, -3)$.
- A. $y = -x - 6$ B. $y = -\frac{1}{2}x - 5$ C. $y = -x + 6$ D. $y = \frac{1}{2}x - 3$
35. The force required to compress a spring varies directly as the change in the length of the spring. If a force of 12 pounds is required to compress a certain spring 3 inches, how much force is required to compress the spring 5 inches?
- A. 20 lb B. 180 lb C. 60 lb D. 2.4 lb
36. Which property is illustrated by the following statement? $2 \cdot (4 \cdot 3) = 2 \cdot (3 \cdot 4)$
- A. Associative Property of Addition B. Commutative Property of Addition
 C. Associative Property of Multiplication D. Commutative Property of Multiplication
37. Solve this system for x :
$$\begin{cases} 2x - 5y = 11 \\ 4x + 3y = -17 \end{cases}$$
- A. $\left\{-\frac{5}{7}\right\}$ B. $\{-2\}$ C. $\left\{\frac{123}{26}\right\}$ D. $\{-3\}$
38. Solve. Express your answer using interval notation. $12 > 6(4 - 2x)$
- A. $(-\infty, -1)$ B. $(-1, \infty)$ C. $(1, \infty)$ D. $(-\infty, 1)$
39. Divide and simplify your answer:
$$\frac{z^2 + 3z - 28}{z^2 + 14z + 49} \div \frac{8 - 2z}{z - 9}$$
- A. $\frac{-z - 9}{2(z + 7)}$ B. $\frac{-(z - 9)}{2(z - 7)}$ C. $\frac{-(z - 9)}{2(z + 7)}$ D. $\frac{z + 9}{2(z - 7)}$

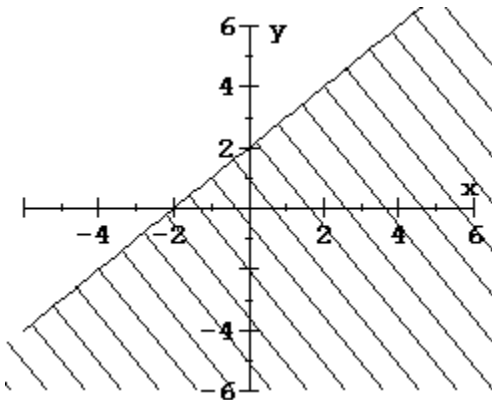
In problems 40 and 41, use the graph of $f(x)$ below to determine your answers.



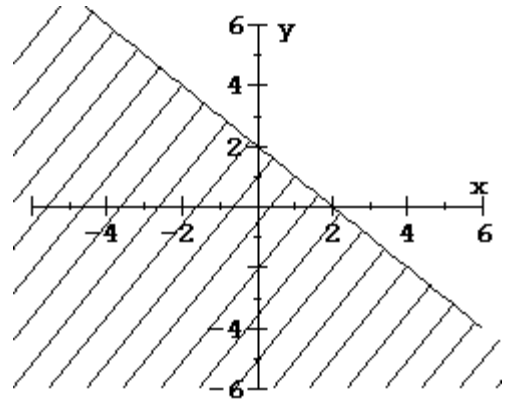
40. Find the domain of the function $f(x)$ using the graph above.
- A. $(-\infty, 4]$ B. $(-\infty, 1]$ C. $(-\infty, \infty)$ D. $[-1, 3]$
41. Find the range of the function $f(x)$ using the graph above.
- A. $(-\infty, 4]$ B. $(-\infty, 1]$ C. $(-\infty, \infty)$ D. $[-1, 3]$

42. Graph: $y \leq x + 2$

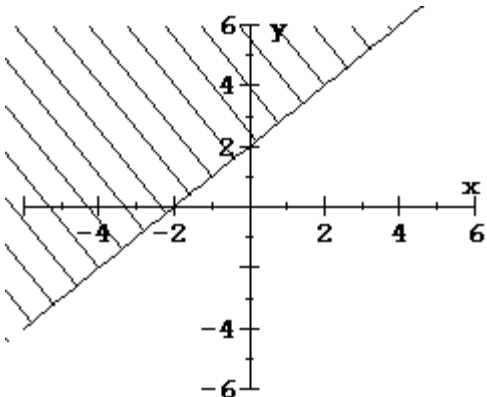
A.



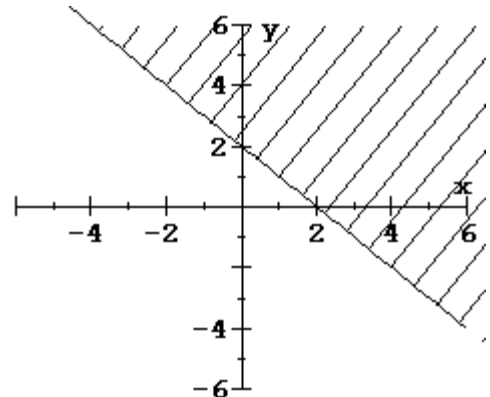
B.



C.



D.



ANSWERS

- | | | | | |
|-------|-------|-------|-------|-------|
| 1. B | 2. A | 3. B | 4. D | 5. B |
| 6. D | 7. A | 8. D | 9. C | 10. A |
| 11. D | 12. A | 13. A | 14. D | 15. C |
| 16. C | 17. B | 18. B | 19. B | 20. D |
| 21. B | 22. D | 23. D | 24. C | 25. D |
| 26. B | 27. D | 28. D | 29. C | 30. B |
| 31. A | 32. B | 33. A | 34. B | 35. A |
| 36. D | 37. B | 38. C | 39. C | 40. C |
| 41. A | 42. A | | | |