

**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.  $\left(-\infty, -\frac{9}{4}\right] \cup [1, \infty)$                       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.  $2a^2+a-6$

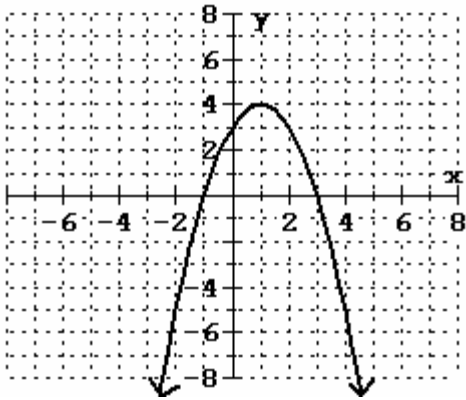
9. Factor completely:  $3p - 3q - px + qx$   
 A.  $3(p - q) - x(p + q)$  B.  $3(p - q) - x(p - q)$  C.  $(p - q)(3 - x)$  D.  $(p - q)(3 + x)$
10. Factor completely:  $8a^3 + 125b^3$   
 A.  $(2a + 5b)(4a^2 - 10ab + 25b^2)$  B.  $(2a + 5b)(4a^2 + 10ab + 25b^2)$   
 C.  $(2a + 5b)(4a^2 - 20ab + 25b^2)$  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:  $y^{-5/8} \left(y^{13/8} - y^{-3/8}\right)$
- 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.  $\frac{z + 9}{2(z - 7)}$

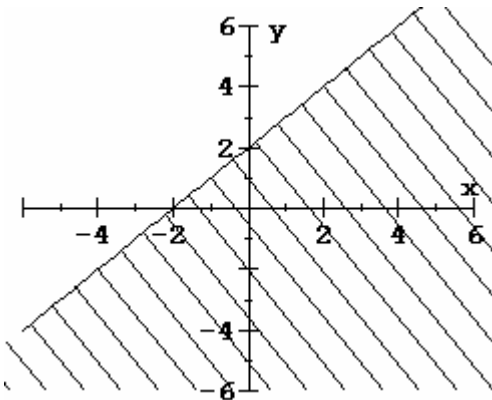
In problems 40 and 41, use the graph of  $f(x)$  below to determine your answers.



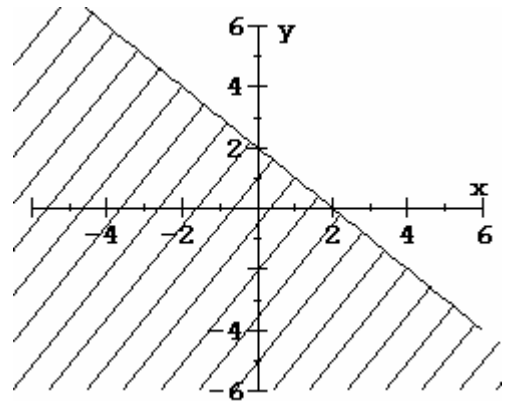
40. Find the domain of the function  $f(x)$  using the graph above.
- A.  $(-\infty, 4]$       B.  $(-\infty, 1]$       C.  $(-\infty, \infty)$       D.  $[-1, 3]$
41. Find the range of the function  $f(x)$  using the graph above.
- A.  $(-\infty, 4]$       B.  $(-\infty, 1]$       C.  $(-\infty, \infty)$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

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

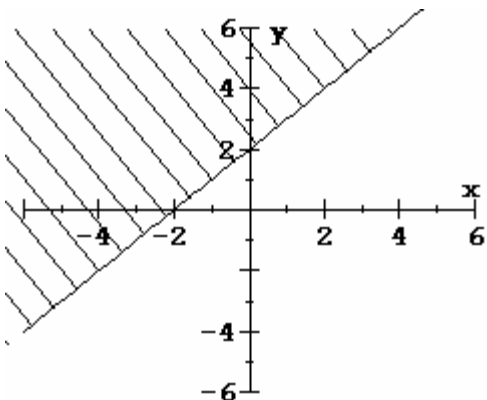
A.



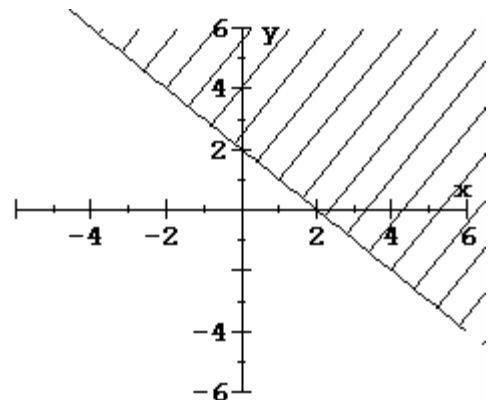
B.



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 |       |       |       |