

# Introductory Algebra – Final Exam Review

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**Note to students:** The final exam for this course will consist of 30 multiple-choice questions and a few open-ended questions. You may use a calculator on the exam, but **no notes** of any kind will be permitted. This review consists of sample questions which are not to be considered identical to those found on the exam.

- 1) Write an algebraic expression that summarizes the story below. 1)\_\_\_\_\_
- Step 1: Subtract 7 from  $x$   
Step 2: Multiply by 3
- A)  $-21x$                       B)  $3x - 7$                       C)  $x - 21$                       D)  $3(x - 7)$
- 2) Evaluate the expression  $a^2 - b^2$ , given  $a = -4$ ,  $b = -3$  2)\_\_\_\_\_
- A) 7                                  B)  $-26$                                   C) 26                                  D)  $-7$
- 3) Simplify.  $7(2r + 6) - 4(2r + 3)$  3)\_\_\_\_\_
- A)  $14r + 37$                       B)  $6r + 30$                       C)  $6r + 45$                       D)  $6r + 54$
- 4) Solve.  $2(x + 2) = 2 - 4(x + 2)$  4)\_\_\_\_\_
- A)  $-2$                                   B) 1                                  C)  $-\frac{5}{3}$                                   D)  $\frac{1}{3}$
- 5) Solve.  $\frac{2}{3}x - 8 = 10$  5)\_\_\_\_\_
- A) 27                                  B)  $1\frac{1}{3}$                                   C) 3                                  D) 12
- 6) Jon works for a vacuum cleaner sales business. He receives \$218 per week in salary plus a commission of 8% of his weekly sales. How much will Jon earn in a week when his sales total \$267? 6)\_\_\_\_\_
- A) \$2354.00                      B) \$218.08                      C) \$239.36                      D) \$38.80
- 7) Solve the inequality  $7 - 3x > 1$  Write your answer in interval notation. 7)\_\_\_\_\_
- A)  $(-\infty, 2)$                       B)  $(-\infty, -2)$                       C)  $(2, \infty)$                       D)  $(-2, \infty)$

8) Which of the following values is NOT in the solution set for  $[-3, 5)$ ? 8) \_\_\_\_\_

- A)  $-3$                       B)  $0$                       C)  $4.99$                       D)  $5$

9) You decide to begin selling frozen bananas at the local carnival. Your cost for each frozen banana is  $\$0.75$  plus you have to pay a fixed weekly fee of  $\$200$  for the booth. Your plan is to sell each frozen banana for  $\$2.75$ . Write an algebraic expression that represents the profit for selling  $n$  frozen bananas in a given week. 9) \_\_\_\_\_

- A)  $2n - 200$                       B)  $2n + 200$                       C)  $2.75n$                       D)  $2.75n - 200$

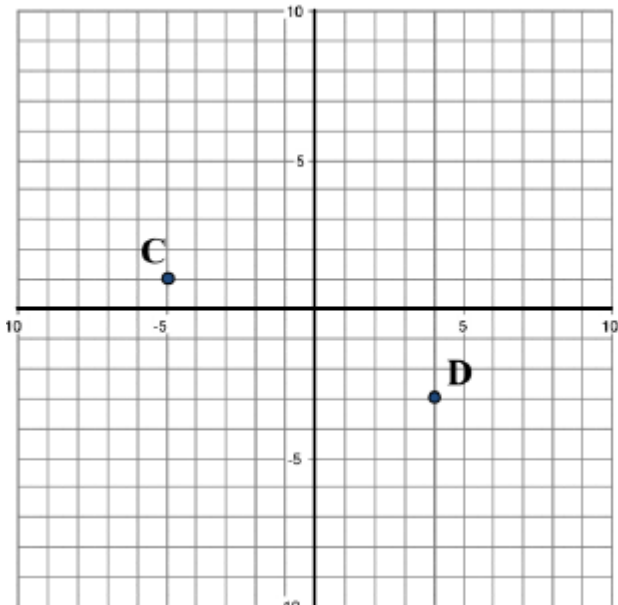
10) Given  $3x - y = -13$ , solve for  $y$ . 10) \_\_\_\_\_

- A)  $y = 3x + 13$                       B)  $y = -3x - 13$                       C)  $y = 13 - 3x$                       D)  $y = 3x - 13$

11) Divide and simplify:  $\frac{5x-3}{3}$ . 11) \_\_\_\_\_

- A)  $5x$                       B)  $5x - 1$                       C)  $\frac{5}{3}x - 1$                       D)  $\frac{5}{3}x$

12) Give the coordinates of the points C and D on the graph. 12) \_\_\_\_\_



- A)  $C(1, -5); D(-3, 4)$                       B)  $C(5, 1); D(4, 3)$   
C)  $C(-5, 1); D(4, -3)$                       D)  $C(1, 5); D(3, 4)$

13) Determine whether the ordered pair  $(6, 1)$  satisfies the equation  $y = 10 - 4x$ . 13) \_\_\_\_\_

- A) Yes                      B) No

14) Determine whether this set of ordered pairs represents a function.

$$\{(-6, 3), (-2, -7), (-1, 2), (-7, -2)\}$$

14) \_\_\_\_\_

A) Function

B) Not a function

15) Determine whether this table of values represents a function.

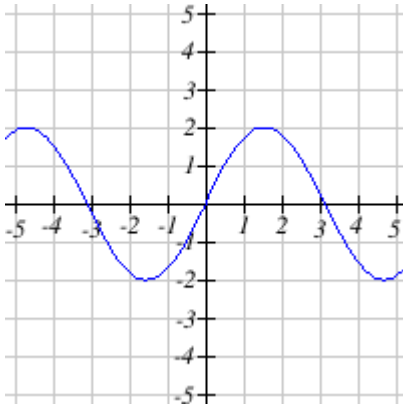
Input	Output
-7	2
-8	2
-9	2
-10	2
-11	2

15) \_\_\_\_\_

A) Function

B) Not a Function

16) Determine whether the graphed relation is a function.



16) \_\_\_\_\_

A) Function

B) Not a Function

17) Given  $f(x) = x^3 - 2x^2 + 3x + 6$ , evaluate  $f(-6)$ .

17) \_\_\_\_\_

A) -50

B) -300

C) -156

D) -120

18) Given  $f(x) = 4x - 11$  determine  $x$  when  $f(x) = -31$

18) \_\_\_\_\_

A) -135

B) -5

C) 109

D) -10.5

19) The function  $C(d) = 19d + 30$  describes the total cost of renting a truck for  $d$  days.  
How many days can the truck be rented for \$163?

19) \_\_\_\_\_

A) 10 days

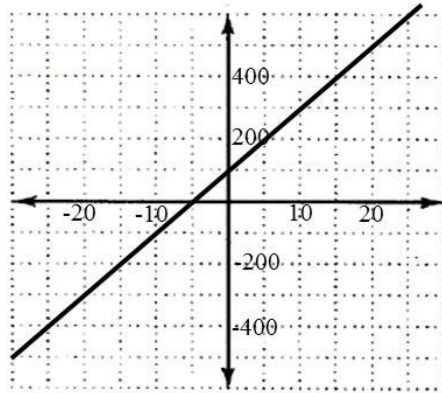
B) 19 days

C) 3127 days

D) 7 days

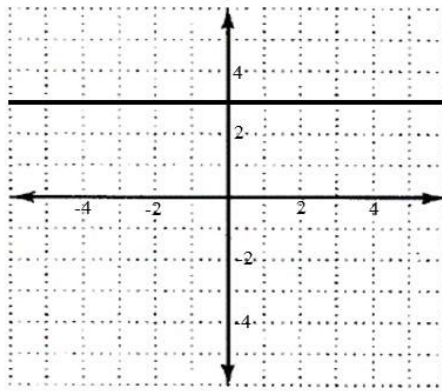
- 20) Suppose the sales of a particular brand of appliance satisfy the relationship  $S(t) = 230t + 3800$ , where  $S(t)$  represents the number of sales in year  $t$ , with  $t = 0$  corresponding to 1982. Find the number of sales in 1999. 20) \_\_\_\_\_
- A) 463570                      B) 7940                      C) 7710                      D) 26570

- 21) Determine the slope of the line shown below 21) \_\_\_\_\_



- A) 1                      B) 100                      C) 20                      D) -5

- 22) Determine the slope of the line shown below. 22) \_\_\_\_\_



- A) 3                      B) 0                      C) Undefined                      D) 1/3

- 23) The slope of a decreasing linear function is always 23) \_\_\_\_\_

- A) Zero                      B) Positive                      C) Undefined                      D) Negative

- 24)  $y = \frac{3}{4}x - 3$  Determine the vertical intercept. 24) \_\_\_\_\_

- A) (3, 0)                      B) (-3, 0)                      C) (0, -3)                      D)  $(0, \frac{3}{4})$

25)  $x = -5$  Determine the vertical intercept. 25) \_\_\_\_\_  
A)  $(-5, 0)$  B)  $(0, 0)$  C)  $(0, -5)$  D) None

26)  $y = x - 4$  Find the slope. 26) \_\_\_\_\_  
A) 1 B)  $-4$  C) 4 D) 0

27)  $x = -3$  Find the slope. 27) \_\_\_\_\_  
A) 3 B) 0 C) Undefined D)  $-3$

28)  $4y - 13x = -3$  Find the slope. 28) \_\_\_\_\_  
A) 13 B)  $-\frac{13}{4}$  C)  $\frac{13}{4}$  D)  $-13$

29)  $y = \frac{3}{4}x - 3$  Determine the horizontal intercept. 29) \_\_\_\_\_  
A)  $(4, 0)$  B)  $(-3, 0)$  C)  $(0, -3)$  D)  $\left(0, \frac{3}{4}\right)$

30)  $3x - 4y = 24$  Determine the horizontal intercept. 29) \_\_\_\_\_  
A)  $(3, 0)$  B)  $(8, 0)$  C)  $(0, -6)$  D)  $(0, 24)$

31) Write the equation of the linear function that generates the table below 31) \_\_\_\_\_

$x$	$y$
1	3.2
3	3.8
5	4.4

A)  $y = 0.3x + 2.9$  B)  $y = 0.6x + 3.2$  C)  $y = -2.9x + 0.3$  D)  $y = -0.3x + 2.9$

32) Write the equation of the linear function with slope  $= -\frac{3}{8}$ , passing through  $(4, 2)$ . 32) \_\_\_\_\_

A)  $y = -\frac{3}{8}x + \frac{1}{2}$  B)  $y = -\frac{3}{8}x + \frac{7}{2}$  C)  $y = -\frac{3}{8}x + \frac{19}{4}$  D)  $y = -\frac{3}{8}x + \frac{13}{4}$

33) Write the equation of the horizontal line passing through  $(7, -2)$ . 33) \_\_\_\_\_

A)  $y = 7$  B)  $x = 7$  C)  $x = -2$  D)  $y = -2$

- 34) Write the equation of the line passing through the point  $(-3, 5)$  that is parallel to  $y = 8 - 2x$ . 34)\_\_\_\_\_
- A)  $y = -2x + 5$       B)  $y = -2x + 8$       C)  $y = -2x - 1$       D)  $y = -2x + 7$
- 35) Write the equation of the line passing through the points  $(6, 1)$  and  $(-9, -3)$  35)\_\_\_\_\_
- A)  $y = \frac{2}{3}x - 3$       B)  $y = -\frac{4}{15}x + \frac{13}{5}$       C)  $y = \frac{4}{15}x - \frac{3}{5}$       D)  $y = \frac{15}{4}x - \frac{43}{2}$
- 36) When a new charter school opened in 2005, there were 350 students enrolled. Since then, the student population has decreased by 100 students every two years. Write a formula for the function  $N(t)$  representing the number of students attending this charter school  $t$  years after 2005. 36)\_\_\_\_\_
- A)  $N(t) = 350 - 100t$     B)  $N(t) = 350 - 50t$     C)  $N(t) = 350 - 2t$       D)  $N(t) = 100 - 350t$
- 37) Simple interest is given by the formula  $A = P + Prt$ . Where  $A$  is the accrued value of the investment after  $t$  years, and  $P$  is the starting principal invested at an annual percentage rate of  $r$ , expressed as a decimal. Sally buys a \$1,000 savings bond that pays 4% simple interest each year. How much will the bond be worth after 5 years? 37)\_\_\_\_\_
- A) \$1216.65      B) \$5378.24      C) \$1200      D) \$3000
- 38) Determine whether the ordered pair  $(-6, -1)$  is a solution to the system. 38)\_\_\_\_\_
- $$3x + y = -19$$
- $$4x + 3y = -27$$
- A) Yes      B) No
- 39) Solve the system of equations. Write the solution as an ordered pair. 39)\_\_\_\_\_
- $$5x + y = -11$$
- $$6x + 5y = 2$$
- A)  $(3, 4)$       B)  $(4, -3)$       C)  $(-3, 4)$       D)  $(-2, -1)$
- 40) Mark the electrician charges \$120 for a house call, and then \$35 per hour for labor. Sara the electrician charges \$100 for a house call, and then \$50 per hour for labor. Write a cost equation for each electrician, where  $y$  is the total cost of the electrical work, and  $x$  is the number of hours of labor. 40)\_\_\_\_\_
- A) Mark:  $y = 35x + 120$       B) Mark:  $y = 50x + 100$   
     Sara:  $y = 50x + 100$       Sara:  $y = 35x + 120$
- C) Mark:  $y = 120x + 35$       D) Mark:  $y = 100x + 50$   
     Sara:  $y = 100x + 50$       Sara:  $y = 120x + 35$

41) Solve the system of equations. Write the solution as an ordered pair. 41)\_\_\_\_\_

$$7x - 6y = 12$$

$$-5x + 2y = -20$$

- A) (-6, 25)                      B) (6, -5)                      C) (6, 5)                      D) (5, 6)

42) Choose the ordered pair which is a solution of the inequality.  $2x + 4y \geq 8$  42)\_\_\_\_\_

- A) (3, 2)                      B) (0, 0)                      C) (1, 1)                      D) (1, 0)

43) The Science Museum charges \$14 for adult admission and \$11 for each child. The total bill for 68 people from a school field trip was \$784. How many children went to the museum? 43)\_\_\_\_\_

- A) 56                      B) 12                      C) 72                      D) 34

44) Let B represent the bill for dinner. You decide to leave a 15% tip. Write an algebraic expression to represent the total amount paid. 44)\_\_\_\_\_

- A) 0.15B                      B) 1.15B                      C) 15B                      D) 15 + B

45) Simplify  $(-3x^3)^5$  45)\_\_\_\_\_

- A)  $-3x^8$                       B)  $-243x^{15}$                       C)  $3x^8$                       D)  $243x^{15}$

46) Simplify  $2x^3(5x^3)$  46)\_\_\_\_\_

- A)  $10x^6$                       B)  $10x^3$                       C)  $10x^9$                       D)  $250x^6$

47) Simplify  $\left(\frac{2n}{5}\right)^4$  47)\_\_\_\_\_

- A)  $\frac{16n^4}{5}$                       B)  $\frac{2n^4}{5}$                       C)  $\frac{16n^4}{625}$                       D)  $\frac{2n^4}{625}$

48) Simplify.  $6n^3 + 5n^3$  48)\_\_\_\_\_

- A)  $11n^6$                       B)  $11n^3$                       C)  $30n^6$                       D)  $11n^9$

49) Assuming that the data in this table are linear, find the value of y when  $x = 0$ . 49)\_\_\_\_\_

x	y
0	
1	24
2	15
3	6

- A) 0                      B) 28                      C) 30                      D) 33

- 50) Evaluate the expression  $\frac{3}{4m}$  for  $m = 12$ . Simplify your answer. 50)\_\_\_\_\_
- A)  $\frac{3}{16}$                       B) 9                      C)  $\frac{1}{16}$                       D) 36

- 51) Identify the degree of the polynomial  $5x^3 - 8x^2 + x + 11$  51)\_\_\_\_\_
- A) 5                      B) 3                      C) 4                      D) 11

- 52) Multiply and simplify.  $(-2x - 6)(x + 8)$  52)\_\_\_\_\_
- A)  $-2x^2 - 22x - 22$     B)  $-2x^2 - 24x - 48$     C)  $-2x^2 - 48x - 22$     D)  $-2x^2 - 22x - 48$

- 53) Multiply and simplify.  $(2a - 11)^2$  53)\_\_\_\_\_
- A)  $4a^2 - 44a + 121$     B)  $4a^2 - 121$                       C)  $2a^2 - 44a + 121$     D)  $4a^2 + 121$

- 54) Divide. Assume the variables represent nonzero quantities.  $\frac{12x^5}{6x^4}$  54)\_\_\_\_\_
- A) 2                      B)  $2x$                       C)  $2x^9$                       D) 12

- 55) The amount of waste in a landfill over a 15 year period (in tons) is shown in the table below.

Years $t$	1	4	6	9	15
Amount of Waste (in tons) $W(t)$	2.5	10	15	22.5	37.5

- For what value of  $t$  is  $W(t) = 15$ ? Include units in your answer. 55)\_\_\_\_\_

- A) 6 years                      B) 6 tons                      C) 37.5 years                      D) 37.5 tons

- 56) In 1995, the cost of tuition at a large Midwestern university was \$144 per credit hour. In 2005, tuition had risen to \$238 per credit hour. Determine a linear equation to represent the cost,  $C$ , of tuition as a function of  $x$ , the number of years since 1995. 56)\_\_\_\_\_

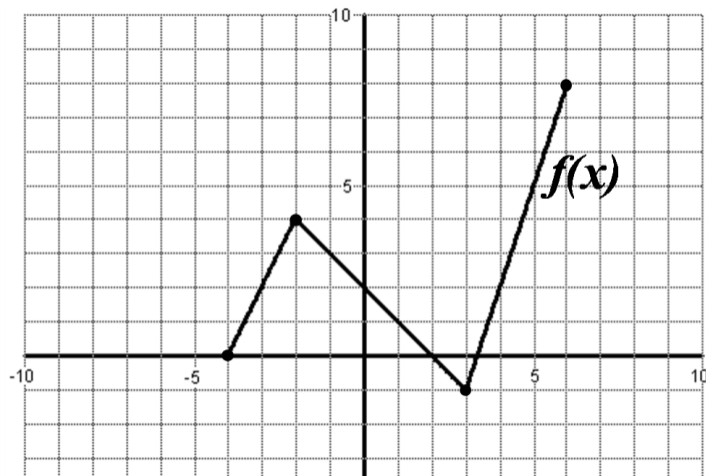
- A)  $C(x) = 144 + 94x$     B)  $C(x) = 238 - 94x$     C)  $C(x) = 144 + 9.4x$     D)  $C(x) = 144 - 9.4x$

- 57) The function  $V(m)$  represents value of an investment (in thousands of dollars) after  $m$  months. Explain the meaning of  $V(24) = 18$ . 57)\_\_\_\_\_

- A) After 24 months, the investment will be worth \$18.  
 B) After 24 months, the investment will be worth \$18,000.  
 C) After 18 months, the investment will be worth \$24.  
 D) After 18 months, the investment will be worth \$24,000.



Problems 58 – 60 refer to the graph of  $f(x)$  shown below



58) Determine the domain of  $f(x)$ . 58) \_\_\_\_\_  
 A)  $-10 \leq x \leq 10$       B)  $-4 \leq x \leq 6$       C)  $-1 \leq x \leq 8$       D)  $0 \leq x \leq 2$

59) Determine the range of  $f(x)$ . 59) \_\_\_\_\_  
 A)  $0 \leq f(x) \leq 4$       B)  $-4 \leq f(x) \leq 6$       C)  $-1 \leq f(x) \leq 8$       D)  $0 \leq f(x) \leq 8$

60) Determine  $f(4)$ . 60) \_\_\_\_\_  
 A)  $-2$       B)  $0$       C)  $2$       D)  $4$