

# Algebra I Midterm Review

1. Write an algebraic expression for *nine times of the square of a number*.

- A  $9 + x^2$       B  $9 - x^2$       C  $9x^2$       D  $x^2 - 9$

2. Evaluate  $2(11 - 5) + 9 \div 3$ .

- F 18      G 15      H 30      J 11

3. Evaluate  $x^2 + xyz$  if  $x = 3$ ,  $y = 5$ , and  $z = 4$ .

- A 69      B 63      C 85      D 21

4. Find the solution of  $\frac{n}{2} - 11 = 3$  if the replacement set is  $\{26, 28, 29, 30, 31\}$ .

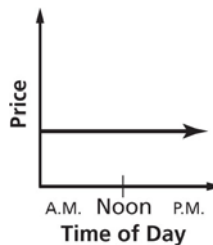
- A 26      B 28      C 30      D 31

5. Somerville High School raised \$740 to buy winter coats for the homeless at \$46.25 each. How many coats can they buy?

- F 12      G 16      H 24      J 34,225

6. Which statement best describes a daily stock price?

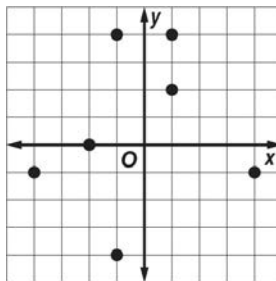
- A The price increased.  
 B The price decreased.  
 C The price did not change.  
 D The price increased then decreased.



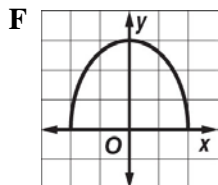
For Questions 7 and 8, use the graph.

7. What is the domain of the relation?

- F  $\{-4, -1, 0, 2, 4\}$       H  $\{-4, -2, -1, 0, 1, 2, 4\}$   
 G  $\{-4, -2, -1, 1, 4\}$       J  $\{-1, 1\}$

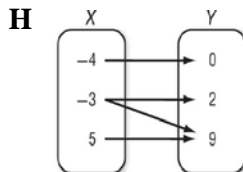


8. Determine which relation is *not* a function.



G

x	y
-2	0
0	0
1	2
3	1



J

x	y
-4	0
-3	9
5	2
6	9

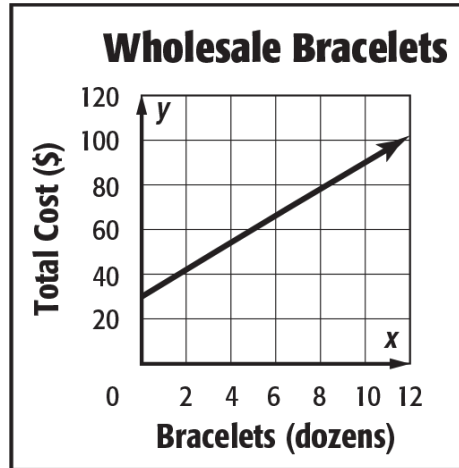
For Questions 9 and 10, use the graph.

9. Interpret the y-intercept of the graph.

- A 0 bracelets cost about \$30.
- B 1 dozen bracelets cost about \$30.
- C 28 dozen bracelets cost \$0.
- D Each dozen bracelets costs about \$5.

10. Interpret the end behavior of the function.

- F The total cost decreases.
- G The cost per dozen decreases.
- H The total cost increases.
- J The cost per dozen increases.



11. Translate the following sentence into an equation.

*The sum of twice a number  $x$  and 13 is two less than three times  $x$ .*

- A  $2(x + 13) + 3x - 2$
- B  $2x + 13 = 2 - 3x$
- C  $2x + 13 = 3x - 2$
- D  $2x + 13 = 3(x - 2)$

12. Solve  $-\frac{3}{8}y = -24$ .

- A -9
- B 9
- C -64
- D 64

13. Solve  $5x + 3 = 23$ .

- F 4
- G  $5\frac{1}{2}$
- H 25
- J 15

14. Solve  $2x + 7 = 5x + 16$ .

- F -3
- G  $\frac{2}{3}$
- H  $-7\frac{2}{3}$
- J 3

15. Solve  $\frac{2}{3}(6x + 30) = -x + 5(x + 4)$ .

- A 6
- B 0
- C all numbers
- D no solution

16. Solve  $2x - y = y$  for  $x$ .

- A  $2y - 2$
- B  $y - 2$
- C  $y$
- D 0

17. In 2005, there were 12,000 students at Beacon High. In 2010, there were 12,250. What is the rate of change in the number of students?

- F 250/yr
- G 50/yr
- H 42/yr
- J 200/yr

18. Elliot's Electricians advertises his rate using the following table. From the information given, determine Elliot's hourly rate.

Hours	2	3	4	5
Charge	\$40	\$60	\$80	\$100

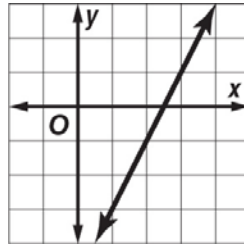
- A \$5 per hour      B \$15 per hour      C \$20 per hour      D \$40 per hour

19. What is the slope-intercept form of the equation of a line with a slope of 5 and a y-intercept of  $-8$ ?

- A  $y = -8x + 5$       B  $y = 8x - 5$       C  $5x - y = -8$       D  $y = 5x - 8$

20. Which equation is graphed at the right?

- F  $2y - x = 10$       H  $2x - y = 5$   
 G  $2x + y = -5$       J  $2y + x = -5$



21. Which is an equation of the line that passes through  $(2, -5)$  and  $(6, 3)$ ?

- A  $y = \frac{1}{2}x - 6$       C  $y = 2x + 12$   
 B  $y = \frac{1}{2}x$       D  $y = 2x - 9$

22. What is the equation of the line through  $(-2, -3)$  with a slope of 0?

- F  $x = -2$       G  $y = -3$       H  $-2x - 3y = 0$       J  $-3x + 2y = 0$

23. Find the slope-intercept form of the equation of the line that passes through  $(-5, 3)$  and is parallel to  $-3y = -12x + 10$ .

- A  $y = -4x - 17$       B  $y = 4x - 13$       C  $y = -4x + 13$       D  $y = 4x + 23$

24. If line  $q$  has a slope of  $-\frac{3}{8}$ , what is the slope of any line perpendicular to  $q$ ?

- F  $-\frac{3}{8}$       G  $\frac{3}{8}$       H  $\frac{8}{3}$       J  $-\frac{8}{3}$

25. Find the inverse of  $\{(4, -1), (3, -2), (6, 9), (8, 5)\}$ .

- F  $\{(8, 5), (6, 9), (3, -2), (4, -1)\}$       H  $\{(-1, 4), (-2, 3), (9, 6), (5, 8)\}$   
 G  $\{(-4, 1), (-3, 2), (-6, -9), (-8, -5)\}$       J  $\{(-1, -2), (9, 5), (4, 3), (6, 8)\}$

26. If  $f(x) = 3x - 4$ , find  $f^{-1}(x)$ .

- A  $f^{-1}(x) = 4x - 3$       B  $f^{-1}(x) = \frac{x+4}{3}$   
 C  $f^{-1}(x) = \frac{x-4}{3}$       D  $f^{-1}(x) = -4 - 3x$

27.  $-51 \leq x + 38$

- A  $\{x \leq -13\}$       B  $\{x \leq 89\}$       C  $\{x \geq -89\}$       D  $\{x \geq -13\}$

28.  $\frac{t}{-2} > 4$

- A  $\{t < -8\}$       B  $\{t < -2\}$       C  $\{t > 2\}$       D  $\{t > -8\}$

29.  $4w - 6 > 6w - 20$

A  $\{w < 7\}$

B  $\{w < 2\}$

C  $\{w < -7\}$

D  $\{w < -2\}$

30. Which compound inequality has the solution set shown in the graph?



A  $-1 < n < 2$

C  $n \geq -1$  or  $n < 2$

B  $-1 \leq n < 2$

D  $-1 < n \leq 2$

31. Which of the following is the solution set of  $-4 < 3t + 5 \leq 20$ ?

F  $\{-3 < t \leq 5\}$

H  $\{t < -3\}$

G  $\{t < -3$  and  $t \leq 5\}$

J  $\{t < -3$  or  $t \geq 5\}$

32. Which of the following is the solution set of  $|2x - 3| > 4$ ?

A  $\{x < -0.5$  or  $x > 3.5\}$

C  $\{-0.5 < x < 3.5\}$

B  $\{x < -1$  or  $x > 7\}$

D  $\{x < 0.5$  or  $x > 3.5\}$

33. Pete's grade on a test was within 5 points of his class average of 94. What is his range of grades on the test?

F  $g \leq 89$  or  $g \geq 99$

H  $g \geq 89$  or  $g \geq 99$

G  $89 \leq g \leq 99$

J  $g < 99$  or  $g < 89$

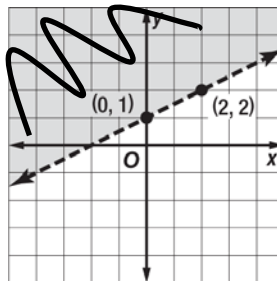
34. Which inequality is graphed at the right?

F  $y < 2x + 1$

H  $y < \frac{1}{2}x + 1$

G  $y > 2x + 1$

J  $y > \frac{1}{2}x + 1$



35. Determine which of the ordered pairs are a part of the solution of  $y + 1 > \frac{1}{2}x + 3$ .

F (2, 3)

G (-4, 0)

H (1, 2)

J (-3, 1)

36. Laurie and Maya sold at most \$50 worth of get-well and friendship cards. The friendship cards,  $x$ , were sold for \$2 each and the get-well cards,  $y$ , were sold for \$1.50 each. Which point represents a reasonable number of cards sold?

F (20, 10)

G (15, 10)

H (18, 20)

J (10, 30)

Use the graph for Question 37.

Determine how many solutions exist for each system of equations.

37.  $y = 3x + 3$

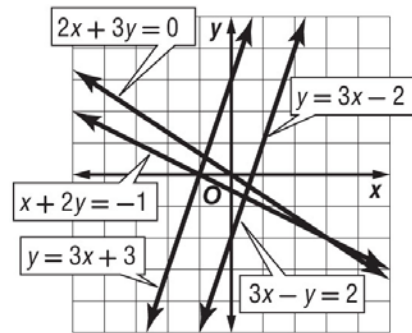
$3x - y = 2$

A no solution

B one solution

C infinitely many solutions

D cannot be determined



38. Solve the system if  $x = 2y + 3$  and  $4x - 5y = 9$ .

A (1, 2)

B (1, -1)

C (-1, -1)

D (-2, 4)

39. Solve the system if  $x - 5y = 20$  and  $x + 3y = -4$ .

A (5, -3)

B (2, -3)

C (5, 0)

D (-40, 5)

40. Your teacher is giving a test that has 5 more four-point questions than six-point questions. The test is worth 120 points. Which system represents this information?

A  $x + 5 = y$   
 $4x + 6y = 120$

B  $x + y = 5$   
 $6x + 4y = 120$

C  $x - y = 5$   
 $6x + 4y = 120$

D  $x - y = 5$   
 $4x + 6y = 120$

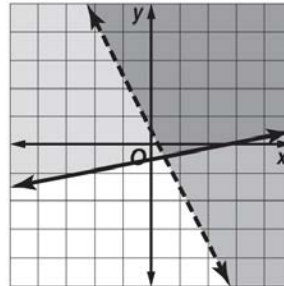
41. What system of inequalities is represented in the graph?

F  $y < -2x + \frac{1}{2}$   
 $y \leq \frac{1}{5}x - \frac{1}{2}$

H  $y < -2x + \frac{1}{2}$   
 $y \geq \frac{1}{5}x - \frac{1}{2}$

G  $y > -2x + \frac{1}{2}$   
 $y \leq \frac{1}{5}x - \frac{1}{2}$

J  $y > -2x + \frac{1}{2}$   
 $y \geq \frac{1}{5}x - \frac{1}{2}$



42. Simplify  $(x^3)^8$ .

A  $x^{24}$

B  $x^{11}$

C  $8x^{24}$

D  $8x^{11}$

43. Simplify  $(-2hk)^4(4h^3k^5)^2$ .

F  $2h^{24}k^{40}$

G  $-64h^9k^{11}$

H  $-256h^{10}k^{14}$

J  $256h^{10}k^{14}$

44. Simplify  $\frac{36b^4c^2}{9b^{-1}c^5}$ . Assume the denominator is not equal to zero.

A  $\frac{27b^4}{c^3}$

B  $\frac{4b^4}{c^3}$

C  $\frac{27b^3}{c^3}$

D  $\frac{4b^5}{c^3}$

45. Simplify  $\frac{(3y^4n^6)^2}{(y^2n^{-3})^4}$ . Assume the denominator is not equal to zero.

F  $\frac{9}{y^{16}}$

G  $\frac{9}{n^{24}}$

H  $9y^{16}$

J  $9n^{24}$

46. Write  $10y^{\frac{1}{2}}$  in radical form.

A  $\sqrt{10y}$

B  $10\sqrt{y}$

C  $10\sqrt{10y}$

D  $y\sqrt{10}$

47. Evaluate  $81^{\frac{3}{4}}$ .

F 3

G 9

H 27

J 243

48. Which equation represents exponential growth?

A  $y = 5(0.84)^x$

B  $y = 5x$

C  $y = 0.3x^3$

D  $y = 5(1.06)^x$

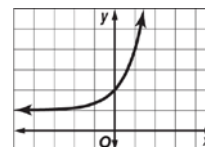
49. Which equation corresponds to the graph shown?

F  $y = (3)^x + 1$

H  $y = 2(3^x)$

G  $y = 2(3^x + 1)$

J  $y = (2 \cdot 3)^{x+1}$



**50.** A certain fast-growing bacteria increases 6% per minute. If there are 100 bacteria now, about how many will there be 12 minutes later?

**F** 172

**G** 201

**H** 48

**J** 190

**51.** A city's population is about 954,000 and is decreasing at an annual rate of 0.1%. Predict the population in 50 years.

**A** 577,176

**B** 906,300

**C** 1,002,888

**D** 907,450