

Algebra 2 Final—Fall 2009

DO NOT WRITE ON THIS EXAM!!

1. Which of the following sets of numbers does **not** contain 4.25?

- A. real B. rational C. irrational D. all of these.

2. What is the value of 15^3 ?

- A. 45 B. 225 C. 3375 D. 50625

3. What is the value of $16^{3/4}$?

- A. 1024 B. 3 C. 4 D. 8

4. What is the slope-intercept form of a linear equation?

- A. $x = my + b$ B. $y = mx - b$ C. $y + mx = b$ D. $y = mx + b$

5. Which property of addition is illustrated by the statement $A + 0 = A$

- A. Associative property B. Commutative Property
C. Identity Property D. Inverse Property

6. Which property of multiplication is illustrated by the statement $\pi \cdot \frac{1}{\pi} = 1$

- A. Associative property B. Commutative Property
C. Identity Property D. Inverse Property

7. Evaluate the expression. $27^{1/3} + 100 \div 4 \cdot (7 - 2)^{-2}$

- A. 4 B. 5 C. 6 D. 7

8. Write the equation that is parallel to the line $y = 4x + 9$ and goes through the point $(1,6)$.

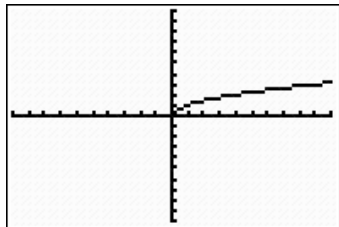
- A. $y = \frac{1}{4}x + 2$ B. $y = 4x + 2$ C. $y = \frac{1}{4}x + 2$ D. $y = 4x - 2$

9. Solve the inequality for x : $-\frac{x}{4} \geq 4$

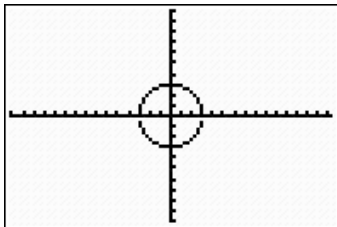
- A. $x \geq 16$ B. $x \leq 16$ C. $x \geq -16$ D. $x \leq -16$

10. Which of the following relations is **not** a function?

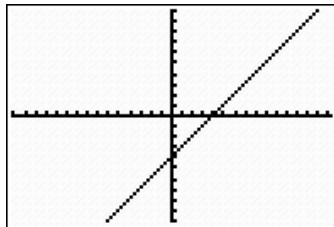
A.



B.



C.



D. none of these

11. If $f(x) = x^2 + 2$ and $g(x) = 3x$, which operation gives the new function $h(x) = 9x^2 + 2$?

- A. $g \circ f$ B. $f \circ g$ C. $f \bullet g$ D. $f \div g$

12. What is the inverse of the function $\{(0,1), (2,3), (4,5), (6,7)\}$?

- A. $\{(0,-1), (-2,-3), (-4,-5), (-6,-7)\}$ B. $\{(0,-1), (3,2), (-5,-4), (6,7)\}$
 C. $\{(1,0), (3,2), (5,4), (7,6)\}$ D. $\{(0,7), (-4,-5), (2,3), (0,-1)\}$

13. Identify the transformations from $f(x) = x^2$ to the function $g(x) = \frac{1}{2}x^2 + 3$.

- A. Vertical compression by a factor of $\frac{1}{2}$, vertical translation 3 units down.
 B. Vertical compression by a factor of $\frac{1}{2}$, vertical translation 3 units up.
 C. Horizontal stretch by a factor of 2, vertical translation 3 units up.
 D. Vertical stretch by a factor of 2, vertical translation 3 units down.

14. What is the inverse function of $g(x) = 2x - 10$?

- A. $y = \frac{1}{2}x + 5$ B. $y = \frac{1}{2}x - 5$ C. $y = 5x$ D. $y = -\frac{1}{2}x + 5$

15. What is **not** an example of the special functions studied this semester?

- A. scatter plots B. step C. piecewise D. absolute value

16. The big idea of solving a system of linear equations is to:

- A. graph the lines B. shade the graph
C. find intersection points D. none of these

17. Solve: $\begin{cases} x + y = 0 \\ 2x + y = 4 \end{cases}$

- A. (4, -4) B. (-4, 4) C. (4, 0) D. (0, 4)

18. Solve: $\begin{cases} y = \frac{1}{2}x - 1 \\ -x + 2y = 8 \end{cases}$

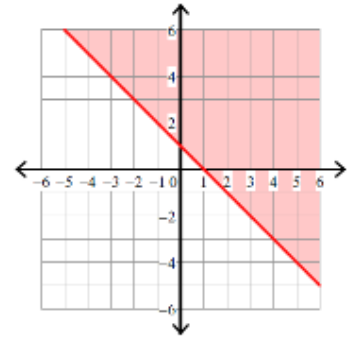
- A. (5, 1.5) B. (0.5, 2) C. no solution D. infinite solutions

19. How would the linear inequality $y \geq -x$ be graphed?

- A. solid line, shade below B. dashed line, shade below
C. solid line, shade above D. dashed line, shade above

20. Write the inequality to represent the following graph:

- A. $y > x + 1$
- B. $y \geq x + 1$
- C. $y \geq -x + 1$
- D. $y > -x + 1$



21. Which vertex would give the maximum to the objective function $P = 2x + 3y$?

- A. (0, 0)
- B. (0, 5)
- C. (3, 7)
- D. (6, 0)

22. A company produces baseball hats and knitted beanies, and sells them to specialty stores. The company is to supply the stores with a total of no more than 100 hats and beanies per day. The store guarantees that they will sell at least 10 and no more than 60 beanies per day and at least 20 hats per day. The company makes a profit of \$10 on each beanie and \$12 on each hat.

Write a system of inequalities to represent the constraints. Let x represent hats and y represent beanies.

- A. $\begin{cases} x + y \geq 100 \\ x \geq 20 \\ y \geq 10 \\ y \leq 60 \end{cases}$
- B. $\begin{cases} x + y \leq 100 \\ x \leq 20 \\ y \leq 10 \\ y = 60 \end{cases}$
- C. $\begin{cases} x + y \geq 100 \\ x \geq 20 \\ y \geq 10 \\ x \geq 0 \end{cases}$
- D. $\begin{cases} x + y \geq 90 \\ x \geq 20 \\ y \geq 10 \\ y \leq 60 \end{cases}$

23. A farmer has 90 acres available for planting corn and alfalfa. Seed costs \$4 per acre for corn and \$6 per acre for alfalfa. Labor costs are \$20 per acre for corn and \$10 per acre for alfalfa. The farmer intends to spend no more than \$480 for seed and no more than \$1400 for labor. The expected income is \$110 per acre for corn and \$150 per acre for alfalfa.

Write the objective function that maximizes the income. Let x represent corn and y represent alfalfa.

- A. $I = 20x + 10y$
- B. $I = 110x + 150y$
- C. $I = 480x + 1400y$
- D. none of these

24. Which of the following is a quadratic?

A. $y = 2x + 3$

B. $y = x$

C. $y = (x + 1)(x - 1)$

D. $y = x^3$

25. Multiply and simplify: $(2x - 3)(2x + 7)$

A. $4x^2 + 20x - 21$

B. $4x^2 + 8x - 21$

C. $4x^2 - 21$

D. $4x^2 - 20x - 21$

26. Solve: $(x+2)^2=121$

A. 11, 9

B. 13, 9

C. 13, -9

D. -13, 9

27. Factor using the greatest common factor: $4x^2 + 32x$

A. $2x(2x + 8)$

B. $2(16x + x^2)$

C. $4(x^2 + 8x)$

D. $4x(x + 8)$

28. Factor the quadratic binomial: $x^2 - 169$

A. $(x - 14)(x + 14)$

B. $(x - 13)(x + 13)$

C. $(x - 13)(x - 13)$

D. $(x - 14)(x - 14)$

29. Use the Zero-Product Property to find the solutions of the function $f(x) = x^2 - 2x - 24$

A. -6, 4

B. 6, -4

C. 6, 4

D. -6, -4

30. Use the Zero-Product Property to find the solutions of the function $f(x) = 6x^2 + 18x + 12$

A. 1, -2

B. -1, 2

C. -1, -2

D. 1, 2