Honors Geometry Challenge Sample Test

50 questions – 60 minutes
Multiple Choice
Use the answer "NOTA" (which stands for None Of The Above) if the answer is not listed

1. Evaluate $7m + 3mn$ when $m = 8$ and $n = 14$

   A) 84 B) 196 C) 392 D) 168 E) NOTA

2. Simplify: $675 \div (6 + 9 \div 3)$

   A) 15 B) 9 C) 75 D) 225 E) 135

3. $(4x^2y^3)^2 =$

   A) $8x^4y^5$ B) $16x^4y^5$ C) $4x^4y^6$

   D) $16x^2y^3$ E) NOTA

4. There are 24 more cars than twice the number of trucks for sale at a dealership. If there are 100 vehicles for sale, how many trucks are there for sale at this dealership?

   A) 28 B) 34 C) 32 D) 38 E) NOTA

5. $(4xy^2)^{-3} =$

   A) $-64x^3y^6$ B) $\frac{1}{4x^3y^6}$ C) $\frac{1}{64x^3y^6}$

   D) $-\frac{4}{x^3y^6}$ E) NOTA

6. If a and b represent integers, $ab = ba$ is an example of which property?
   A) Associative Property B) Commutative Property

   C) Distributive Property D) Closure Property E) NOTA

7. Find the equation that best represents the following word problem:
In a certain freshman class, the number of girls is 83 less than twice the number of boys (b). The total number of students in that freshman class is 259

A) $b + 2b = 259 - 83$ B) $b + 2b - 83 = 259$

C) $b + 83 - 2b = 259$ D) $b + 2b = 259$

E) NOTA

8. The sum of one fifth of a number and three is equal to half of the number. What is the number?

A) 5 B) 10 C) 15 D) 20 E) NOTA

9. Which one of the following equals a negative number?

A) $(-5)+9$
B) $(-9)+5$
C) $9 + 5$
D) $5+(-9)+4$
E) $9-(-5)$

10. Solve the system of equations: $3x + 4y = 11$
$x - 2y = -3$

A) $x = 1 \quad y = 2$
B) $x = -1 \quad y = \frac{3}{4}$
C) $x = 2 \quad y = -3$
D) $x = 1 \quad y = -2$
E) NOTA

11. Jaime bought a car in 2008 for $28,500. By 2011, the car was worth $23,700. Based on a linear model, what will the value of the car be in 2015?

A) $17,300 B) $17,550 C) $18,100

D) $18,475 E) NOTA

12. If $\begin{cases} 3x + y = 10 \\ x - 4y = -1 \end{cases}$ then y =

A) 1 B) 3 C) −2 D) $\frac{7}{13}$ E) − 1

13. Solve: $\frac{1}{3}y + 28 = -5$

A) −11 B) 11 C) 99 D) 96 E) NOTA

14. Solve: 3x + 17 − 5x = 12 − (6x + 3)

A) −2 B) 4 C) 0 D) − 4 E) NOTA

15. You and three friends are eating a pizza with 12 pieces. Each person eats the same number of pieces. Let x represent the number of pieces each person eats. Which of the following equations is an algebraic model for the situation?

A) $3x = 12$ B) $\frac{1}{3}x = 12$ C) $4x = 12$

D) $\frac{1}{4}x = 12$ E) NOTA

16. Billy received a $100 gift certificate for a gift. He wants to buy shoes that cost $38 and shirts that cost $12 each. Which of the following inequalities represents how many shirts Billy can buy?

A) $n \leq 6$ B) $n \geq 5$ C) $n < 5$

D) $n \leq 5$ E) NOTA

17. The girl's volleyball team is selling T-shirts and pennants to raise money for new uniforms. If T-shirts are $10 each and pennants are $4 each, which of the following combinations of items sold would meet their goal of raising more than $250.

A) 16 T-shirts and 20 pennants
B) 20 T-shirts and 12 pennants
C) 18 T-shirts and 18 pennants
D) 15 T-shirts and 20 pennants
E) NOTA

18. Simplify: $(3cd^6)^3(cd)^4$

A) $27c^7d^{10}$ B) $27c^7d^{13}$ C) $9c^7d^{22}$

D) $27c^{12}d^{72}$ E) $27c^7d^{22}$

19. Simplify: $(4c^4 + 1) - (7c^3 - 3) + (2c^4 + 5c^3)$

A) $6c^4 + 2c^3 - 4$ B) $6c^4 - 2c^3 + 4$ C) $6c^4 - 2c^3 - 2$

D) $2c^4 - 2c^3 - 2$ E) $4c + 4$

20. The number ten is raised to a power between 0 and 1. The answer has to be between which two numbers?

A) 0 and 1
B) 1 and 10
C) 10 and 100 but not 5
D) 0 and 100 but not 50
E) – 10 and 0

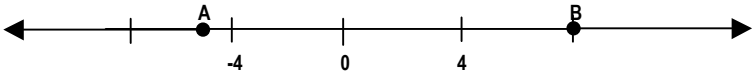
21. Which of the following is the least?

A) .27 B) $\frac{1}{4}$ C) $\frac{3}{8}$ D) $\frac{2}{11}$ E) 11%

22. If $x = 2$ and $y = -3$, then $-xy^2 =$

A) −36 B) −18 C) −12 D) 12 E) 18

23. Which is closest to the distance between A and B on the number line?



A) -9 B) -5 C) 13 D) 5 E) 12

24. Define $p \sim q$ by the equation $p \sim q = p^2q^3 - 3q$. Then

$2 \sim 3 =$

A) 108 B) 27 C) 99 D) 117 E) 89

25. If $7x + 4 = -19 + 5x$, then $2x - 14$ equals

A) 23 B) -23 C) -3 D) 16 E) -37

26. Which of the following best describes the circled part of the statement?

$\bigcirc{7x + 9} = 40$

A) Coefficient
B) Variable
C) Term
D) Expression
E) Solution

27. Solve for x:

$5x - 10 = 2 - 2x + 10(x - 3)$

A) 6 B) 3 C) - 3 D) - 14 E) NOTA

28. Solve for r: $A = p + prt$

A) $\frac{A}{1+tp}$ B) $t(A - p)$ C) $\frac{A - p}{pt}$

D) $\frac{pt}{A - p}$ E) NOTA

29. Which expression below illustrates the Associative Property?

A) $abc = bac$
B) $2(x-3) = 2x-6$
C) $(p+3)-t = p+(3-t)$
D) $5+(-5) = 0$
E) NOTA

30. Write the answer in proper scientific notation:
$(7 \times 10^5) \times (3 \times 10^4)$

A) 21×10^9 B) 21×10^{20} C) 2.1×10^8

D) 2.1×10^7 E) NOTA

31. Simplify the following expression

$$\left(\frac{2w^2z^5}{3y^4}\right)^3$$

A) $\frac{2w^5z^8}{3y^7}$ B) $\frac{8w^6z^{15}}{27y^{12}}$ C) $\frac{8w^5z^8}{27y^7}$
D) $\frac{2w^6z^{15}}{3y^{12}}$ E) NOTA

32. $\frac{x^2y^6z^3}{x^2y^2} =$

A) y^4 B) y^4z^3 C) z^3 D) $x\,y\,z$ E) y^6z^3

33. $(y^2 + 2y - 3) - (4y^2 - 5y - 2) =$

A) $-3y^2 - 9y + 5$ B) $-3y^2 - 9y + 1$ C) $-3y^2 - y + 5$

D) $-3y^2 + y - 5$ E) $-3y^2 + 7y - 1$

34. Find the x-coordinate of the system:

$3x + 3y = 4$
$x - 3y = 1$

A) $\frac{6}{5}$ B) $\frac{1}{3}$ C) 1 D) $\frac{5}{4}$ E) $\frac{5}{3}$

35. Find the slope of the line that passes through (4, 7) and (1, 3)

A) $-\frac{4}{3}$ B) $-\frac{3}{4}$ C) $\frac{3}{4}$ D) $\frac{4}{3}$ E) 2

36. Find the slope and y-intercept of the line whose equation is $y = -\frac{3}{2}x + 4$

A) slope = 2, y-int = $\frac{3}{2}$ B) slope = $-\frac{3}{2}$, y-int = 4

C) slope = 2, y-int = –3 D) slope = –2, y-int = $\frac{3}{2}$

E) slope = $\frac{3}{2}$, y-int = –2

37. Find the equation of the line containing the point (–3, 5) and having slope: 4

A) $y = 4x - 7$ B) $y = 4x$ C) $y = -4x - 24$

D) $y = 4x + 17$ E) NOTA

38. Solve: $4x + 5 \leq 3 + 6x$

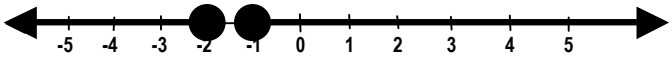
A) $x \leq -4$ B) $x \geq 1$ C) $x \leq 4$

D) $x \geq -4$ E) $x \geq 4$

39. Which of the following graphs represents the solution of $|2x + 3| \geq 1$

A)

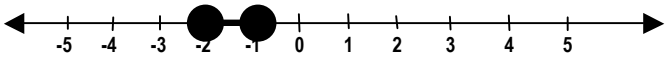
B)



C)

D)

E)



40. Which absolute value equation has solutions $x = 8, x = 14$?

A) $|x - 3| = 11$ B) $|x - 4| = 12$ C) $|x - 11| = 3$

D) $|x - 12| = 4$ E) NOTA

41. Which pair of lines represent graphs that are perpendicular?

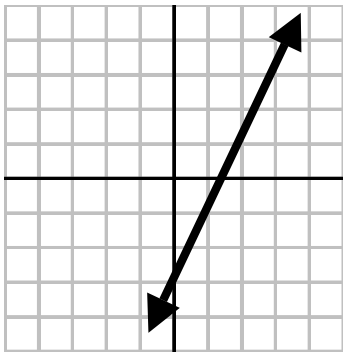
A) $y = -3x + 5$ $y = -3x + 2$ B) $y = 5x + 5$ $y = 10x + 5$ C) $2y = 4x - 16$ $y = 2x - 8$

D) $y = 9$ $x = 5$ E) $y = x$ $y = 3$

42. The graph of $x - 4y + 8 = 0$ crosses the y-axis at

A) -8 B) -2 C) 0 D) 2 E) 8

43. Which equation is graphed to the right?



A) $x + y = 2$ B) $2x - y = 3$ C) $2x + y = 3$

D) $2x - y = 5$ E) $3x + y = 2$

44. What is the first step to solving this problem:

$3x - 10 = 2(x + 3)$

A) add 10 to both sides of the equation
B) subtract 3 from both sides of the equation
C) distribute the 2 on the right side
D) divide by 3 on both sides of the equation
E) NOTA

45. Solve: $\frac{x-8}{5}=\frac{2}{4}$

A) $\frac{9}{2}$ B) $\frac{5}{2}$ C) $\frac{21}{2}$ D) 18 E) NOTA

46. Solve: $-\frac{x}{4}\le 2$

A) $x\le -8$ B) $x\le 6$ C) $x\ge 8$

D) $x\ge -8$ E) NOTA

47. The sum of 3 consecutive integers is 102. Find the largest integer.

A) 33 B) 35 C) 37 D) 39 E) NOTA

48. Evaluate $f(x)=\frac{1}{3}x,\ \text{for } x=4$

A) $1\frac{1}{3}$ B) $\frac{1}{12}$ C) $\frac{3}{4}$ D) -12 E) NOTA

49. Suppose a population of 250 crickets doubles in size every six months. How many crickets will there be after 2 years?

A) 4,000 crickets B) 6,000 crickets C) 2,000 crickets

D) 1,000 crickets E) NOTA

50. $(-2.7)^0$

A) 0 B) 1 C) -1 D) -2.7 E) NOTA

Answers

1	C	26	D
2	C	27	A
3	E	28	C
4	D	29	C
5	C	30	E
6	B	31	B
7	B	32	B
8	B	33	E
9	B	34	D
10	A	35	D
11	A	36	B
12	A	37	D
13	E	38	B
14	A	39	B
15	C	40	C
16	D	41	D
17	C	42	D
18	E	43	B
19	B	44	C
20	B	45	C
21	E	46	D
22	B	47	B
23	C	48	A
24	C	49	A
25	E	50	B