

**2008 Hoover HS Math Tournament
Pre-Algebra Written Test**

1. If $r > 1$ which one of the following must also be true ?

- a) $r + 1 = 2$ b) $r - 1 = 0$ c) $r + 1 > 2$ d) $r = 2$ e)NOTA

2. Evaluate the following: $44 - 33 \div 11 - 1 \times 2$

- a) 27 b) 2 c) 40 d) 39 e)NOTA

3. If $a = b$ and $b = 2c$, find $a + b + c$ when $c = 6$

- a) 18 b) 24 c) 30 d) 36 e)NOTA

4. Solve: $2(2x - 2(2 + 2)) = 8x$

- a) 4 b) 2 c) -2 d) 8 e)NOTA

5. A circle with center at the origin passes through the point $(3, 4)$. What is the diameter of the circle?

- a) 7 units b) 10 units c) 5 units d) 12 units e)NOTA

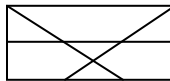
6. Which quadrant does the graph of $y = -3x - 3$ NOT pass through?

- a) I b) II c) III d) IV e)NOTA

7. The following equation has two answers. What is the sum of the answers? $(a + 2)(a - 2) = 21$

- a) 4 b) 10 c) 7 d) 0 e)NOTA

8. Find the total number of triangles in the drawing.



- a) 7 b) 9 c) 4 d) 8 e)NOTA

9. A code to enter a building has a single letter followed by three digits. How many different codes are possible?

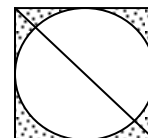
- a) 36 b) 326 c) 3026 d) 26000 e) NOTA

10. Find the surface area of a cube that has a volume of $\frac{8}{27} \text{ cm}^3$.

- a) $\frac{8}{3} \text{ cm}^2$ b) 6 cm^2 c) $\frac{1}{3} \text{ cm}^2$ d) $\frac{8}{27} \text{ cm}^2$ e)NOTA

11. The area of the circle is $18\pi \text{ cm}^2$, find the length of the diagonal.

- a) 12cm b) 36cm c) 144 cm d) 81cm e)NOTA



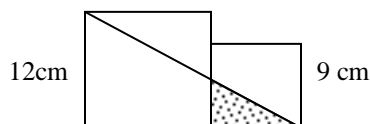
12. How many integer solutions does the equation have? $|2x - 4| < 2$

- a) 6 b) 3 c) 2 d) 1 e)NOTA

13. A boy and a girl want to have a secret meeting. They are 3000 feet apart and walk toward each other at the same time. The boy walks twice as fast as the girl does. If the boy walks 100 feet per minute, how long does it take them to meet?

- a) 30 minutes b) 20 minutes c) 40 minutes d) 10 minutes e)NOTA

14. Two squares are placed as shown
Find the area of the shaded region.



- a) $\frac{81}{4} \text{ cm}^2$ b) 26 cm^2 c) $\frac{162}{7} \text{ cm}^2$ d) $\frac{27}{2} \text{ cm}^2$ e)NOTA

15. Consider the linear equation $y = mx + 12$ and statements I and II:
Which answer choice is true?

- I. The line is parallel to the x axis.
II. The line has a slope of m

- a) Sometimes I
Sometimes II b) Sometimes I
Always II c) Always I
Sometimes II d) Always I
Always II e)NOTA

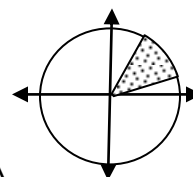
16. Which one of the following numbers is the mean of the other three numbers? 10 , 6 , 8 , 16

- a) 6 b) 8 c) 10 d) 16 e)NOTA

17. The line $y = 1$ is reflected over the line $x = 1$. The equation of the resulting line is:

- a) $x + y = 2$ b) $y = 1$ c) $y = -1$ d) $x - y = 1$ e)NOTA

18. A segment connecting the origin to the point (12 , 5) is rotated 30° counter clockwise to create the shaded shape. Find the area of the shaded region.



- a) $\frac{169}{12} \pi \text{ units}^2$ b) $\frac{169}{30} \pi \text{ units}^2$ c) $169 \pi \text{ units}^2$ d) $30 \pi \text{ units}^2$ e) NOTA

19. Paul looks back at his life and sees that he spent $\frac{1}{6}$ of his life as a child, $\frac{1}{8}$ of his life as a youth, $\frac{1}{2}$ of his life as a man and the remaining 15 years as an old man. How old is Paul?

- a) 24 b) 96 c) 74 d) 72 e)NOTA

20. The edges of a of a rectangular prism are in a ratio of 2 : 3 : 5 and the shortest edge has a length of x. Find the ratio of the volume of the prism to it's surface area.

- a) $3x : 1$ b) $15x : 62$ c) $10x : 3$ d) $15x : 31$ e)NOTA

21. If Ms. Campbell can grade x papers in y hours. How many hours will it take to grade z papers?

- a) $\frac{xy}{z}$ hours b) xyz hours c) $\frac{xz}{y}$ hours d) $\frac{yz}{x}$ hours e)NOTA

22. Find x :

$$\frac{10}{6 + \frac{x-2}{8}} = \frac{5}{6}$$

- a) 50 b) 2 c) 10 d) 48 e)NOTA

23. Soup and salad cost \$12. Salad and a sandwich cost \$13. Soup and a sandwich cost \$11. What would the total cost be if you bought three soups and three salads and three sandwiches?

- a) \$54 b) \$108 c) \$36 d) \$18 e)NOTA

24. Which of the quadrants of the coordinate plane does not contain an answer to the function: $f(x) = \frac{2}{x-3} - 4$

- a) I b) II c) III d) IV e)NOTA

25. The Braille alphabet uses a series of six dots that are either raised or recessed to form each symbol.

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Six dots are always used and form a rectangle as shown. • • Using this information, how many different symbols can be formed?

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- a) 12 b) 24 c) 48 d) 64 e)NOTA

TB1 Find the sum of the first 300 positive integers.

TB2 The 4th root of a number is $\frac{1}{2}$. Find the number.

TB3 Find the sum of the unique, positive, integer factors of 81.