

**Honors Algebra 2 Challenge Pre-Test**

50 questions – 60 minutes

Multiple Choice

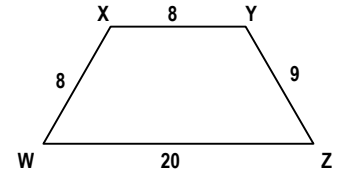
Use the answer "NOTA" (which stands for None Of The Above) if the answer is not listed

1. Solve:  $x - (15x - 6) = 104$   
A)  $\frac{-55}{7}$     B)  $\frac{-49}{8}$     C)  $\frac{-55}{8}$     D)  $-7$     E) NOTA
  
2. If  $y = 3$ , then  $-y^2 =$   
A)  $-36$     B)  $-18$     C)  $-9$     D)  $9$     E)  $6$
  
3. 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
  
4.  $(4x - 3)(x - 4) =$   
A)  $4x^2 + 19x + 12$     B)  $4x^2 - 7$     C)  $4x^2 + 12$   
D)  $4x^2 - 19x - 12$     E) NOTA
  
5. Find the distance between  $P(-4, 6)$  and  $Q(-2, -8)$   
A)  $2\sqrt{58}$     B)  $2\sqrt{10}$     C)  $10\sqrt{2}$     D)  $4\sqrt{58}$     E) NOTA
  
6. Factor:  $16x^2 - a^2 =$   
A)  $(4x - a)^2$     B)  $(4x + a)^2$     C)  $(16x - a)^2$   
D)  $(4x - a)(x + a)$     E)  $(4x - a)(4x + a)$

7. Given the measure of angle A is  $33^\circ$ . Find the sum of the measures of the complementary angle, supplementary angle and vertical angle for angle A.
- A)  $257^\circ$     B)  $237^\circ$     C)  $\frac{247^\circ}{3}$     D)  $279^\circ$     E) NOTA
8. One of the solutions of the equation  $x^2 - x = 12$  is:
- A)  $-12$     B)  $-4$     C)  $4$     D)  $3$     E) NOTA
9. Find the area of a circle with circumference  $32\pi$
- A)  $228\pi$     B)  $256\pi$     C)  $16\pi$     D)  $16$     E) NOTA
10. The value of  $3^{-2} + 2^{-3}$  is:
- A)  $-1$     B)  $\frac{1}{17}$     C)  $\frac{17}{72}$     D)  $\frac{1}{72}$     E) NOTA
11. Solve:  $15 + 10x > -4x + 3$
- A)  $x > -\frac{9}{7}$     B)  $x < -\frac{6}{7}$     C)  $x < -6$
- D)  $x > -\frac{6}{7}$     E) NOTA
12. The perimeter of a rectangle is 28 in. If its length is 9 in., find its area.
- A) 6 sq. in.    B) 45 sq. in.    C) 90 sq. in.    D) 2.5 sq. in.    E) NOTA
13. Solve the equations  $2(m + 5) = -25$  and  $4(2 - n) - 2 = 41$ . What is the sum of the solutions for  $m$  and  $n$ ?
- A) 17    B)  $-35$     C)  $-\frac{35}{2}$     D)  $-\frac{35}{4}$     E)  $-\frac{105}{4}$

14. If  $x + y = 6$  and  $x = y + 2$ , then find the numerical value of  $y$ .
- A) 1      B) 2      C) 3      D) 4      E) NOTA

15. If you choose a random point on a side of the trapezoid, what is the probability that it is on WZ?



- A)  $\frac{1}{45}$       B)  $\frac{4}{5}$       C)  $\frac{8}{45}$       D)  $\frac{4}{9}$       E)  $\frac{5}{9}$

16. Find the equation of the line containing the point  $(-3, -12)$  and having slope:  $-4$ .

- A)  $y = -4x$       B)  $y = 4x$       C)  $y = -4x - 24$   
D)  $y = 3x - 4$       E) NOTA

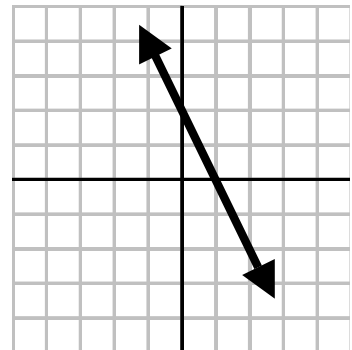
17. Find the middle term to make this polynomial factorable:

$$x^2 + \underline{\hspace{2cm}} + 10$$

- A)  $12x$       B)  $13x$       C)  $7x$       D)  $3x$       E)  $-10x$

18. Which equation is graphed to the right?

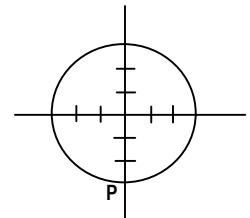
- A)  $x + y = 2$       B)  $2x - y = 3$       C)  $2x + y = 3$   
D)  $2x - y = 5$       E) NOTA



19. A boy is mowing a rectangular lawn 40 ft. long and 30 ft. wide. He has cut all of it except for a rectangle that is 20 ft. long and 15 ft. wide. What fractional part of the lawn remains uncut?

- A)  $\frac{1}{4}$       B)  $\frac{9}{40}$       C)  $\frac{7}{240}$       D)  $\frac{1}{2}$       E) NOTA

20. Factor completely:  $18x^3 - 63x^2 + 9x =$
- A)  $9(2x^3 - 7x^2 + x)$       B)  $9x(2x^2 - 7x)$   
 C)  $9x(2x^2 - 7x + x)$       D)  $9x(2x^2 - 7x + 1)$   
 E)  $9x(2x - 1)(x - 3)$
21. Find the equation of the perpendicular bisector between K(3, -6) and L(10, 17)
- A)  $23x - 7y = 138$       B)  $7x + 23y = 461$   
 C)  $23x - 7y = 54$       D)  $11x - 7y = -9$   
 E) NOTA
22. In the figure to the right, the circle is centered at the origin and passes through point P (0, -3). Which of the following points does it also pass through?
- A) (3, 3)      B)  $(-2\sqrt{2}, -1)$       C) (2, 6)  
 D) (1.5, 1.3)      E) (-3, 4)
23. Find the center and radius of the circle whose equation is:  
 $x^2 + (y - 3)^2 = 10$
- A) center (0, -3) radius = 10  
 B) center (1, 3) radius = 5  
 C) center (0, 3) radius =  $\sqrt{10}$   
 D) center (0, -3) radius =  $\sqrt{10}$   
 E) center (0, 3) radius = 5
24. Find the geometric mean between 8 and  $\frac{1}{4}$
- A)  $\sqrt{2}$       B)  $\frac{1}{2}$       C)  $\frac{\sqrt{2}}{2}$       D) 2      E) 16

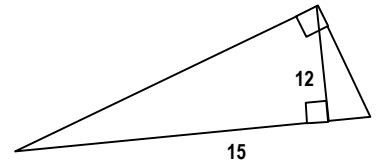


25. Find the volume of a cylinder that has a diameter of 12 in. and a height of 15 in.

A)  $2160\pi$  B)  $90\pi$  C)  $540\pi$  D)  $2700\pi$  E) NOTA

26. Find the area of a right triangle with hypotenuse 15 in. and altitude 12 in. (to the hypotenuse).

A)  $90 \text{ in}^2$  B)  $180 \text{ in}^2$  C)  $54 \text{ in}^2$  D)  $108 \text{ in}^2$  E) NOTA

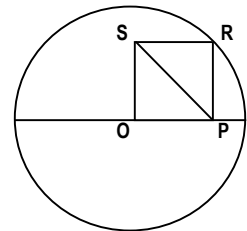


27. Given  $A(0, 2)$ ,  $B(5, 5)$ , and  $C(7, 2)$ . Reflect  $\triangle ABC$  over the  $x$ -axis. Give the coordinates of the vertices of the image.

A)  $A'(0, 2)$   $B'(-5, 5)$   $C'(-7, 2)$   
 B)  $A'(-2, 0)$   $B'(-5, 5)$   $C'(-2, 7)$   
 C)  $A'(0, -2)$   $B'(5, -5)$   $C'(7, -2)$   
 D)  $A'(2, 0)$   $B'(5, 5)$   $C'(2, 7)$   
 E) NOTA

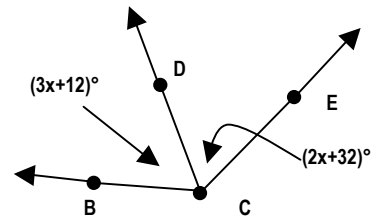
28. In the figure to the right,  $O$  is both the center of the circle with radius 2 and a vertex of the square  $OPRS$ . What is the length of diagonal  $PS$ ?

(A)  $1/2$  (B) 1 (C) 4 (D) 2 (E)  $2/3$



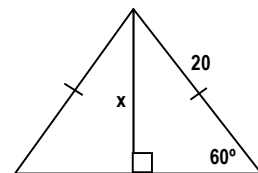
29. In the diagram at the right,  $m\angle BCE$  is  $144^\circ$ . Find  $m\angle ECD$ .

A)  $72^\circ$  B)  $20^\circ$  C)  $42^\circ$  D)  $144^\circ$  E) NOTA



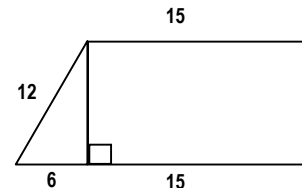
30. Find the exact value of  $x$ .

A) 10 B)  $10\sqrt{3}$  C) 5 D)  $5\sqrt{3}$  E) NOTA



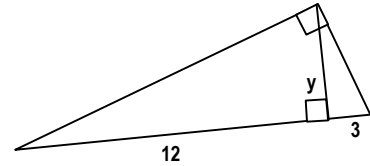
31. Find the area of the trapezoid.

- A) 432    B)  $6\sqrt{3}$     C)  $126\sqrt{3}$     D)  $108\sqrt{3}$     E) NOTA



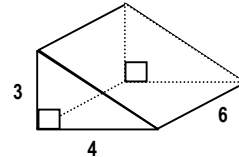
32. Find the exact value of y:

- A)  $3\sqrt{3}$     B) 6    C) 36    D)  $6\sqrt{5}$     E) NOTA



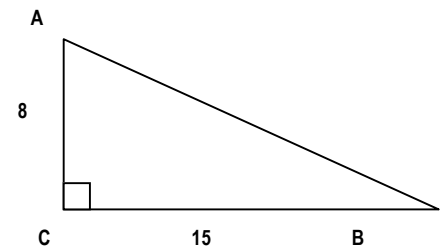
33. Find the volume of the prism.

- A) 13    B) 84    C) 30    D) 72    E) NOTA



34. Find  $\cos A$

- A)  $\frac{8}{15}$     B)  $\frac{15}{8}$     C)  $\frac{15}{17}$     D)  $\frac{8}{17}$     E) NOTA

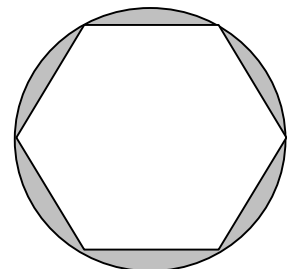


35. Give the most specific name for the polygon with vertices (5,-2), (4,2), (0,3), and (1,-1)

- A) parallelogram    B) rectangle  
 C) square    D) rhombus  
 E) quadrilateral

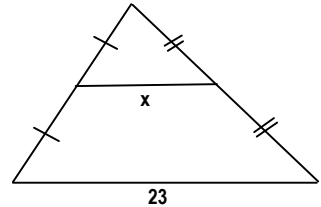
36. Find the area of the shaded region (a regular hexagon inscribed in the circle with a radius of 6)

- A)  $54 - 36\pi$     B)  $36\pi - 108$     C)  $6\pi$   
 D)  $108\pi^2$     E)  $36\pi - 54\sqrt{3}$

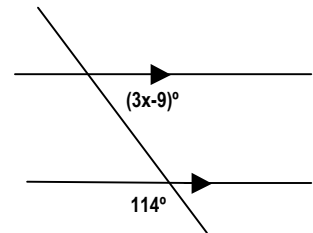


37. Suppose  $\triangle ABC \sim \triangle PQR$  with  $AB:PQ = 5:9$   
 What is the ratio of the area of  $\triangle ABC$  to  $\triangle PQR$ ?
- A) 125:729    B) 5:9    C) 25:81    D) 2:3    E) NOTA

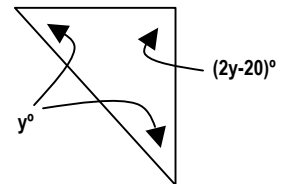
38. Find the value of  $x$ .
- A) 11.5    B) 23    C) 46    D)  $\frac{23}{3}$     E) Not enough information



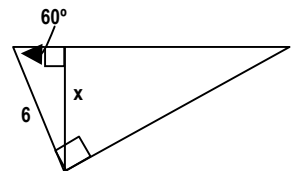
39. Find the value of  $x$ .
- A) 16    B) 41    C) 5    D) 25    E) 66



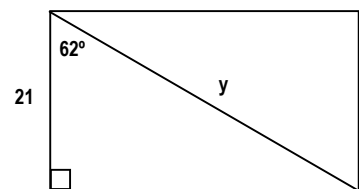
40. Find the value of  $y$ .
- A) 50    B) 55    C) 40    D)  $\frac{200}{3}$     E) 45



41. Find the value of  $x$ .
- A) 3    B)  $3\sqrt{3}$     C)  $6\sqrt{3}$     D)  $3\sqrt{2}$     E)  $2\sqrt{3}$

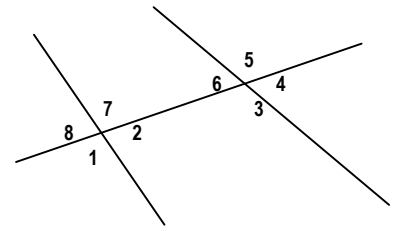


42. Find the value of  $y$ .
- A) 44.7    B) 9.9    C) 23.8    D) 34.1    E) NOTA



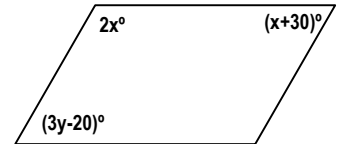
43. Which of these are a pair of same-side interior angles?

- A) 7, 3    B) 2, 3    C) 1, 3    D) 5, 3    E) NOTA



44. Find the value of  $x$  and  $y$  that will make this a parallelogram.

- A)  $x = 45, y = \frac{110}{3}$     B)  $x = 50, y = \frac{100}{3}$   
C)  $x = 50, y = 20$     D)  $x = 50, y = 60$



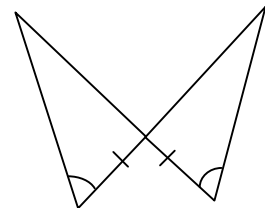
E) NOTA

45. The lengths of two sides of a triangle are 6 and 3. What do you know about the third side?

- A) It's between 6 and 9    B) It's less than 6  
C) It's between 3 and 9    D) It's less than 9  
E) NOTA

46. Which method can be used to prove that these two triangles are congruent?

- A) HL    B) SAS    C) SSS    D) ASA    E) NOTA



47. What kind of polygon has angle measures that add up to  $1440^\circ$ ?

- A) Hexagon    B) Heptagon    C) Decagon  
D) Dodecagon    E) NOTA



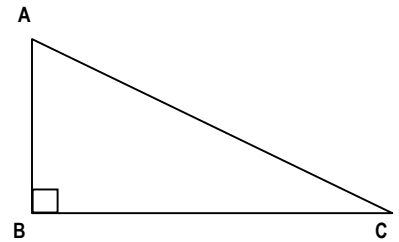
For problems 48-50:

Fill-in the blanks for a two-column proof of the theorem:

***The two acute angles of a right triangle are complementary.***

Given: In  $\triangle ABC$ ,  $\angle B$  is a right angle

Prove:  $\angle A$  and  $\angle C$  are complementary



Statements:

Reasons:

- |  |                               |
|--|-------------------------------|
| 1. In $\triangle ABC$ , $\angle B$ is a right angle. | 1. Given                      |
| 2. $m\angle B = 90^\circ$                            | 2. <u>    #48    </u>         |
| 3. $m\angle A + m\angle B + m\angle C = 180^\circ$   | 3. <u>    #49    </u>         |
| 4. $m\angle A + 90^\circ + m\angle C = 180^\circ$    | 4. Substitution (steps 2 & 3) |
| 5. $m\angle A + m\angle C = 90^\circ$                | 5. Subtraction Property       |
| 6. $\angle A$ and $\angle C$ are complementary       | 6. <u>    #50    </u>         |

48. Choose from:

- A) Triangle Sum Theorem
- B) Definition of a right angle
- C) Definition of congruent angles
- D) Linear Pair Theorem
- E) Definition of complementary angles

49. Choose from:

- A) Triangle Sum Theorem
- B) Definition of a right angle
- C) Definition of congruent angles
- D) Linear Pair Theorem
- E) Definition of complementary angles

50. Choose from:

- A) Triangle Sum Theorem
- B) Definition of a right angle
- C) Definition of congruent angles
- D) Linear Pair Theorem
- E) Definition of complementary angles

**Answers for  
Honors Alg2  
Challenge  
Pretest**

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