

# Regents Practice Test 1

## Geometry

### Part I: Multiple Choice

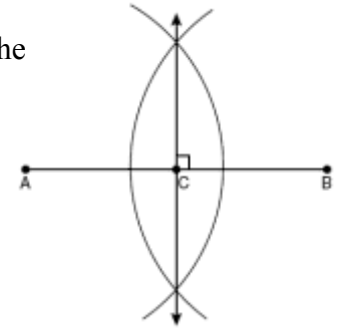
1. Line  $k$  is drawn so that it is perpendicular to two distinct planes,  $P$  and  $R$ . What must be true about planes  $P$  and  $R$ ?
- [1] Planes  $P$  and  $R$  are skew  
 [2] Planes  $P$  and  $R$  are parallel.  
 [3] Planes  $P$  and  $R$  are perpendicular.  
 [4] Plane  $P$  intersects plane  $R$  but is not perpendicular to plane  $R$ .

2. The vertices of  $\triangle ABC$  are  $A(-1,-2)$ ,  $B(-1,2)$ , and  $C(6,0)$ . Which conclusion can be made about the angles of  $\triangle ABC$ ?
- [1]  $m\angle A = m\angle B$                       [3]  $m\angle ACB = 90$   
 [2]  $m\angle A = m\angle C$                       [4]  $m\angle ABC = 60$

3. What is the equation of a line that passes through the point  $(-3,-11)$  and is parallel to the line whose equation is  $2x - y = 4$ ?

- [1]  $y = 2x + 5$                       [3]  $y = \frac{1}{2}x + \frac{25}{2}$   
 [2]  $y = 2x - 5$                       [4]  $y = -\frac{1}{2}x - \frac{25}{2}$

4. The diagram shows the construction of the perpendicular bisector of  $\overline{AB}$ . Which statement is *not* true?

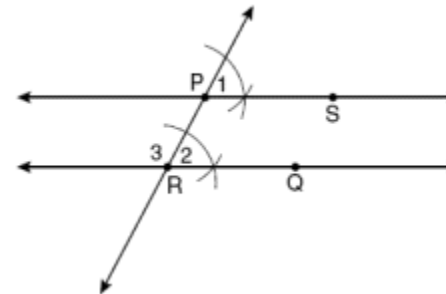


- [1]  $AC = CB$                       [3]  $AC = 2AB$   
 [2]  $CB = \frac{1}{2}AB$                       [4]  $AC + CB = AB$

5. Isosceles trapezoid  $ABCD$  has diagonals  $\overline{AC}$  and  $\overline{BD}$ . If  $AC = 5x + 13$  and  $BD = 11x - 5$ , what is the value of  $x$ ?

- [1] 28                      [2]  $10\frac{3}{4}$                       [3] 3                      [4]  $\frac{1}{2}$

6. The diagram below illustrates the construction of  $\overline{PS}$  parallel to  $\overline{RQ}$  through point  $P$ .



Which statement justifies this construction?

- [1]  $m\angle 1 = m\angle 2$                       [3]  $\overline{PR} \cong \overline{RQ}$   
 [2]  $m\angle 1 = m\angle 3$                       [4]  $\overline{PS} \cong \overline{RQ}$

7. What are the center and radius of a circle whose equation is  $(x - A)^2 + (y - B)^2 = C$ ?

- [1] center =  $(A, B)$ ; radius =  $C$   
 [2] center =  $(-A, -B)$ ; radius =  $C$   
 [3] center =  $(A, B)$ ; radius =  $\sqrt{C}$   
 [4] center =  $(-A, -B)$ ; radius =  $\sqrt{C}$

8. A polygon is transformed according to the rule:  $(x, y) \rightarrow (x + 2, y)$ . Every point of the polygon moves two units in which direction?

- [1] up      [2] down      [3] left      [4] right

9. The lines  $3y + 1 = 6x + 4$  and  $2y + 1 = x - 9$  are

- [1] parallel      [3] the same line  
 [2] perpendicular      [4] neither parallel nor perpendicular

10. In which triangle do the three altitudes intersect outside the triangle?

- [1] right triangle      [3] obtuse triangle  
 [2] acute triangle      [4] equilateral triangle

11. What is the negation of the statement "The Sun is shining"?

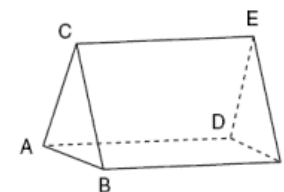
- [1] It is cloudy.      [3] It is not raining.  
 [2] It is daytime.      [4] The Sun is not shining.

12. Triangle  $ABC$  has vertices  $A(1,3)$ ,  $B(0,1)$ , and  $C(4,0)$ . Under a translation,  $A'$ , the image point of  $A$ , is located at  $(4,4)$ . Under this same translation, point  $C'$  is located at

- [1]  $(7,1)$       [2]  $(5,3)$       [3]  $(3,2)$       [4]  $(1,-1)$

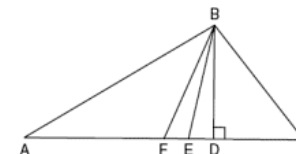
13. The figure in the diagram at the right is a triangular prism.

- [1]  $\overline{DE} \cong \overline{AB}$       [3]  $\overline{AD} \parallel \overline{CE}$   
 [2]  $\overline{AD} \cong \overline{BC}$       [4]  $\overline{DE} \parallel \overline{BC}$



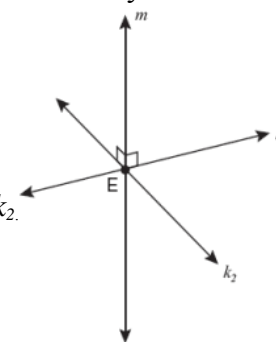
14. Given  $\triangle ABC$  with base  $\overline{AFEDC}$ , median  $\overline{BF}$ , altitude  $\overline{BD}$ , and  $\overline{BE}$  bisects  $\angle ABC$ , which conclusion is valid?

- [1]  $\angle FAB \cong \angle ABF$       [3]  $\overline{CE} \cong \overline{EA}$   
 [2]  $\angle ABF \cong \angle CBD$       [4]  $\overline{CF} \cong \overline{FA}$

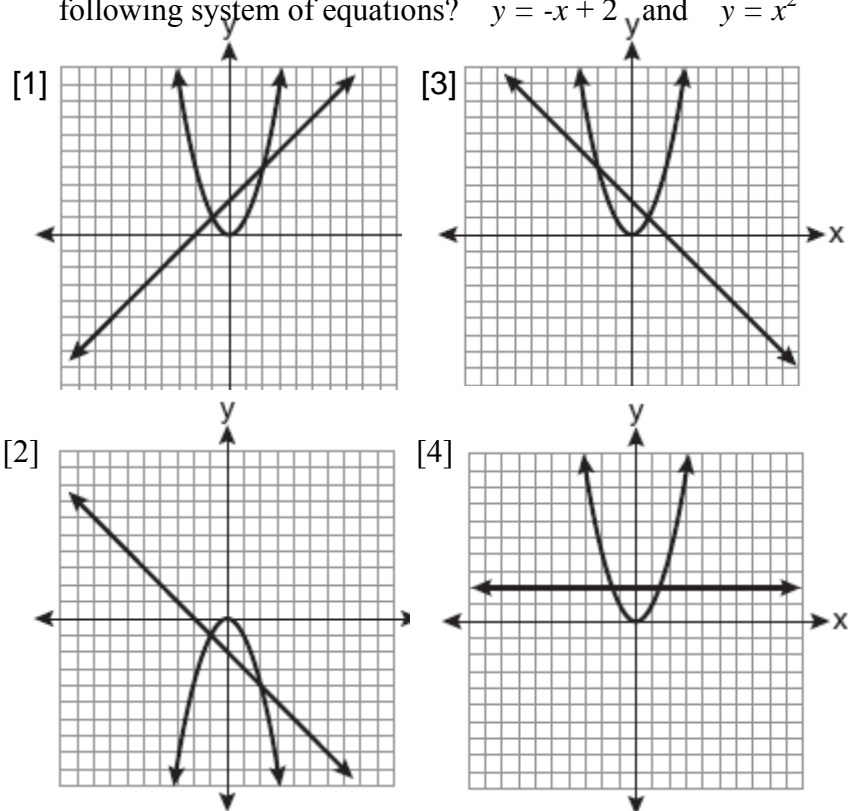


15. Lines  $k_1$  and  $k_2$  intersect at point E. Line  $m$  is perpendicular to lines  $k_1$  and  $k_2$  at point E. Which statement is always true?

- [1] Lines  $k_1$  and  $k_2$  are perpendicular.  
 [2] Line  $m$  is parallel to the plane determined by lines  $k_1$  and  $k_2$ .  
 [3] Line  $m$  is perpendicular to the plane determined by lines  $k_1$  and  $k_2$ .  
 [4] Line  $m$  is coplanar with lines  $k_1$  and  $k_2$ .

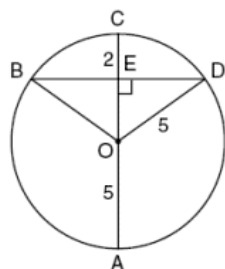


16. Which graph could be used to find the solution to the following system of equations?  $y = -x + 2$  and  $y = x^2$



17. In the diagram, circle  $O$  has a radius of 5, and  $CE = 2$ . Diameter  $\overline{AC}$  is perpendicular to chord  $\overline{BD}$  at  $E$ . What is the length of  $\overline{BD}$ ?

- [1] 12
- [2] 10
- [3] 8
- [4] 4



18. Line segment  $\overline{AB}$  has endpoints  $A(2, -3)$  and  $B(-4, 6)$ . What are the coordinates of the midpoint of  $\overline{AB}$ ?

- [1]  $(-2, 3)$
- [2]  $(-1, 1\frac{1}{2})$
- [3]  $(-1, 3)$
- [4]  $(3, 4\frac{1}{2})$

19. A rectangular prism has a volume of  $3x^2 + 18x + 24$ . Its base has a length of  $x + 2$  and a width of 3. Which expression represents the height of the prism?

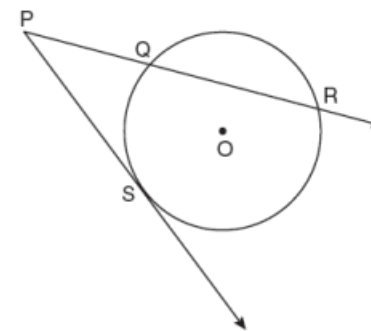
- [1]  $x + 4$
- [2]  $x + 2$
- [3] 3
- [4]  $x^2 + 6x + 8$

20. What is the slope of a line perpendicular to the line whose equation is  $5x + 3y = 8$ ?

- [1]  $\frac{5}{3}$
- [2]  $\frac{3}{5}$
- [3]  $-\frac{3}{5}$
- [4]  $-\frac{5}{3}$

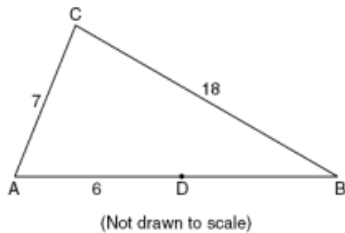
21. In the diagram at the right,  $\overline{PS}$  is a tangent to circle  $O$  at point  $S$ ,  $\overline{PQR}$  is a secant,  $PS = x$ ,  $PQ = 3$ , and  $PR = x + 18$ . What is the length of  $\overline{PS}$ ?

- [1] 6
- [2] 9
- [3] 3
- [4] 27



(Not drawn to scale)

22. In the diagram below of  $\triangle ABC$ ,  $D$  is a point on  $\overline{AB}$ ,  $AC = 7$ ,  $AD = 6$ , and  $BC = 18$ . The length of  $\overline{DB}$  could be



- [1] 5      [2] 12      [3] 19      [4] 25

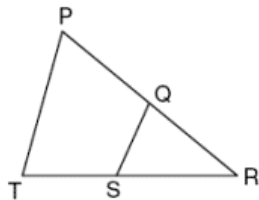
23. What is the measure of an interior angle of a regular octagon?

- [1]  $45^\circ$                       [3]  $120^\circ$   
 [2]  $60^\circ$                       [4]  $135^\circ$

24. The diameter of a circle has endpoints at  $(-2,3)$  and  $(6,3)$ . What is an equation of the circle?

- [1]  $(x-2)^2 + (y-3)^2 = 16$       [3]  $(x+2)^2 + (y+3)^2 = 16$   
 [2]  $(x-2)^2 + (y-3)^2 = 4$       [4]  $(x+2)^2 + (y+3)^2 = 4$

25. In the diagram below of  $\triangle PRT$ ,  $Q$  is a point on  $\overline{PR}$ ,  $S$  is a point on  $\overline{TR}$ ,  $\overline{QS}$  is drawn, and  $\angle RPT \cong \angle RSQ$ . Which reason justifies the conclusion that  $\triangle PRT \sim \triangle SRQ$ ?



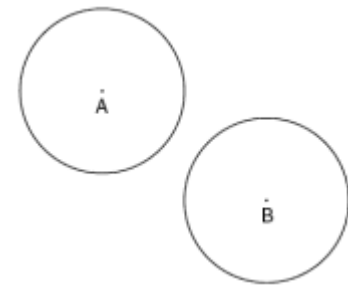
- [1] AA      [2] ASA      [3] SAS      [4] SSS

26. The endpoints of  $\overline{AB}$  are  $A(3,2)$  and  $B(7,1)$ . If  $\overline{A'B'}$  is the result of the transformation of  $\overline{AB}$  under  $D_2 \circ T_{-4,3}$ , what are the coordinates of  $A'$  and  $B'$ ?

- [1]  $A'(-2,10)$  and  $B'(6,8)$       [3]  $A'(2,7)$  and  $B'(10,5)$   
 [2]  $A'(-1,5)$  and  $B'(3,4)$       [4]  $A'(14,-2)$  and  $B'(22,-4)$

27. In the diagram, circle  $A$  and circle  $B$  are shown. What is the total number of lines of tangency that are common to circle  $A$  and circle  $B$ ?

- [1] 1  
 [2] 2  
 [3] 3  
 [4] 4



28. Two triangles are similar, and the ratio of each pair of corresponding sides is  $2 : 1$ . Which statement regarding the two triangles is *not* true?

- [1] Their areas have a ratio of  $4 : 1$ .  
 [2] Their altitudes have a ratio of  $2 : 1$ .  
 [3] Their perimeters have a ratio of  $2 : 1$ .  
 [4] Their corresponding angles have a ratio of  $2 : 1$ .