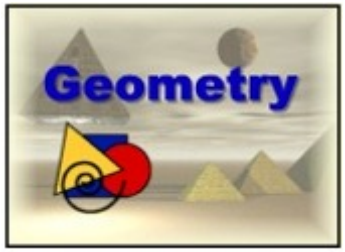



# Regents Practice Test 1
## Geometry

***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 $\Delta ABC$ are $A(-1,-2)$, $B(-1,2)$, and $C(6,0)$. Which conclusion can be made about the angles of $\Delta ABC$?

[1] $m\angle A = m\angle B$

[2] $m\angle A = m\angle C$

[3] $m\angle ACB = 90$

[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] $y = 2x + 5$

[2] $y = 2x - 5$

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

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

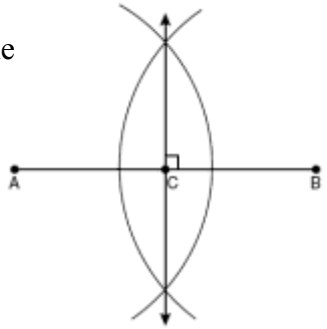
**4.** The diagram shows the construction of the perpendicular bisector of $\overline{AB}$. Which statement is *not* true?

[1] $AC = CB$

[2] $CB = \frac{1}{2}AB$

[3] $AC = 2AB$

[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 $x$?

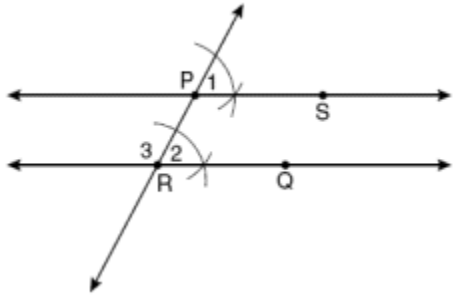
[1] 28

[2] $10\frac{3}{4}$

[3] 3

[4] $\frac{1}{2}$

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




Which statement justifies this construction?

[1] $m\angle 1 = m\angle 2$

[2] $m\angle 1 = m\angle 3$

[3] $\overline{PR} \cong \overline{RQ}$

[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.

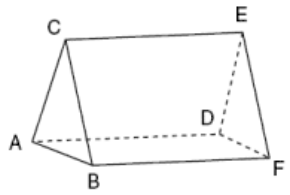
**12.** Triangle $ABC$ has vertices $A(1,3)$, $B(0,1)$, and $C(4,0)$. Under a translation, $A'$, the image point of $A$, is located at (4,4). Under this same translation, point $C'$ is located at

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

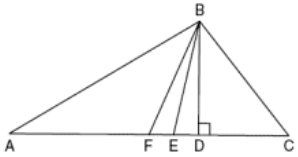
**13.** The figure in the diagram at the right is a triangular prism.

[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] $\overline{CF} \cong \overline{FA}$

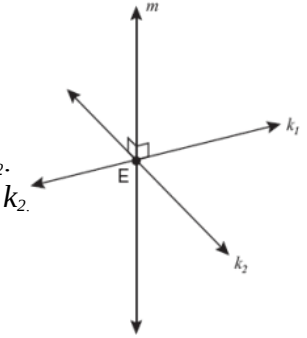
**15.** Lines $k_1$ and $k_2$ intersect at point E. Line $m$ is perpendicular to lines $k_1$ and $k_2$ at point E. Which statement is always true?

[1] Lines $k_1$ and $k_2$ are perpendicular.

[2] Line $m$ is parallel to the plane determined by lines $k_1$ and $k_2$.

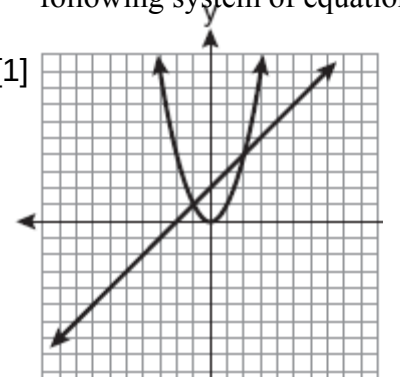
[3] Line $m$ is perpendicular to the plane determined by lines $k_1$ and $k_2$.

[4] Line $m$ is coplanar with lines $k_1$ and $k_2$.

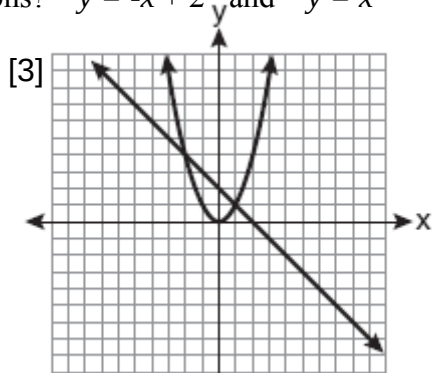


**16.** Which graph could be used to find the solution to the following system of equations? $y = -x + 2$ and $y = x^2$

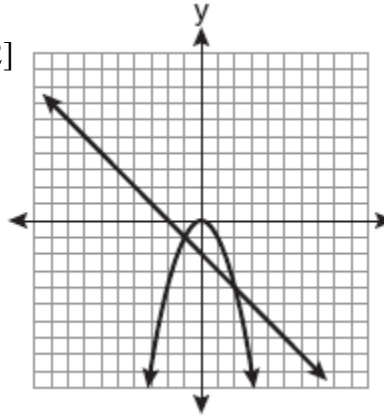
[1]



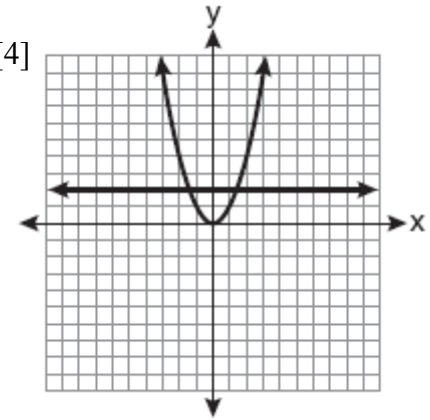

[3]




[2]

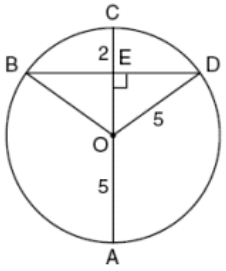



[4]




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

**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?

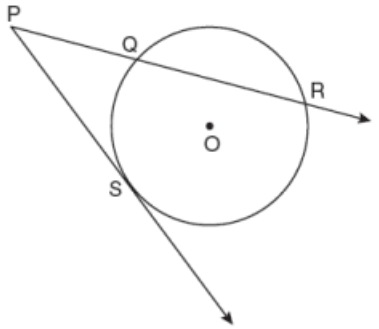
[1] $x + 4$ [2] $x + 2$ [3] 3 [4] $x^2 + 6x + 8$

**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] $-\frac{5}{3}$

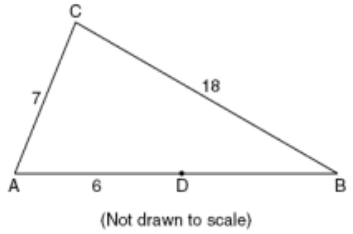
**21.** In the diagram at the right, $\overline{PS}$ is a tangent to circle $O$ at point $S$, $\overline{PQR}$ is a secant, $PS = x$, $PQ = 3$, and $PR = x + 18$. What is the length of $\overline{PS}$?

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




(Not drawn to scale)

**22.** In the diagram below of $\Delta ABC$, $D$ 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

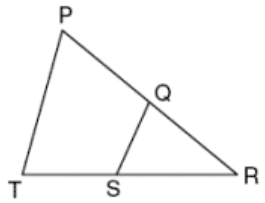
**23.** What is the measure of an interior angle of a regular octagon?

[1] 45º [3] 120º
[2] 60º [4] 135º

**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 $\measuredangle RPT \cong \measuredangle RSQ$. Which reason justifies the conclusion that $\Delta PRT \sim \Delta SRQ$?



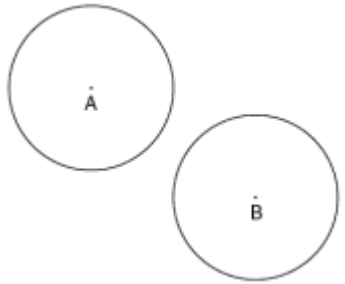

[1] AA [2] ASA [3] SAS [4] SSS

**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)

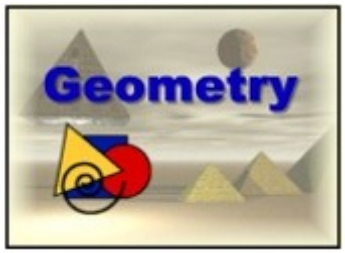
**27.** In the diagram, circle $A$ and circle $B$ are shown. What is the total number of lines of tangency that are common to circle $A$ and circle $B$?

[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.

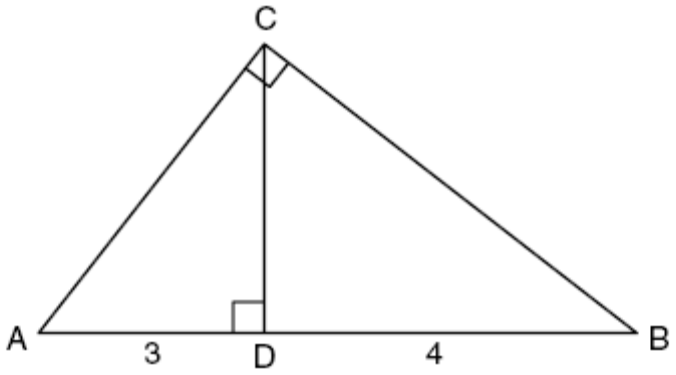



# Regents Practice Test 1

Geometry

**Part II**: *Show work on separate paper.*

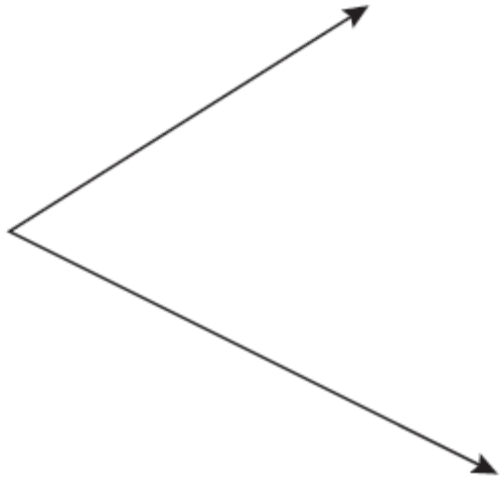
**29** In the diagram below of right triangle $ACB$, altitude $\overline{CD}$ intersects $\overline{AB}$ at $D$. If $AD = 3$ and $DB = 4$, find the length of $\overline{CD}$ in simplest radical form.




**30** The vertices of $\triangle ABC$ are $A(3,2)$, $B(6,1)$, and $C(4,6)$. Identify and graph a transformation of $\triangle ABC$ such that its image, $\triangle A'B'C'$, results in $\overline{AB} \parallel \overline{A'B'}$.

**31** The endpoints of $\overline{PQ}$ are $P(-3,1)$ and $Q(4,25)$. Find the length of $\overline{PQ}$.

**32** Using a compass and straightedge, construct the bisector of the angle shown below. [*Leave all construction marks.*]



**33** The volume of a cylinder is 12,566.4 $cm^3$. The height of the cylinder is 8 cm. Find the radius of the cylinder to the *nearest tenth of a centimeter*.

**34** Write a statement that is logically equivalent to the statement "If two sides of a triangle are congruent, the angles opposite those sides are congruent."

Identify the new statement as the converse, inverse, or contrapositive of the original statement.

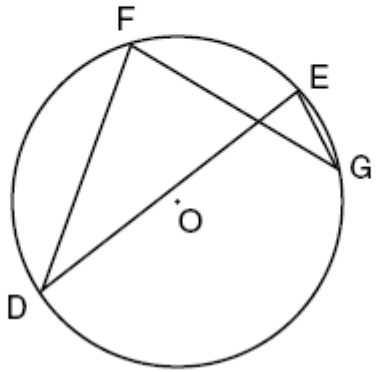
**Part III:**

**35** On the set of axes below, graph and label $\triangle DEF$ with vertices at $D(-4,-4)$, $E(-2,2)$, and $F(8,-2)$.

If $G$ is the midpoint of $\overline{EF}$ and $H$ is the midpoint of $\overline{DF}$, state the coordinates of $G$ and $H$ and label each point on your graph.

Explain why $\overline{GH} \parallel \overline{DE}$.

**36** In the diagram below of circle $O$, chords $\overline{DF}$, $\overline{DE}$, $\overline{FG}$, and $\overline{EG}$ are drawn such that $m\widehat{DF} : m\widehat{FE} : m\widehat{EG} : m\widehat{GD} = 5 : 2 : 1 : 7$. Identify one pair of inscribed angles that are congruent to each other and give their measure.




**37** A city is planning to build a new park. The park must be equidistant from school $A$ at (3,3) and school $B$ at (3,–5). The park also must be exactly 5 miles from the center of town, which is located at the origin on the coordinate graph. Each unit on the graph represents 1 mile.

On the set of axes below, sketch the compound loci and label with an **X** all possible locations for the new park.

**Part IV:**

**38** In the diagram below, quadrilateral $ABCD$ is inscribed in circle $O$, $\overline{AB} \parallel \overline{DC}$, and diagonals $\overline{AC}$ and $\overline{BD}$ are drawn.

Prove that $\triangle ACD \cong \triangle BDC$.