

Regents Practice Test 3

Geometry

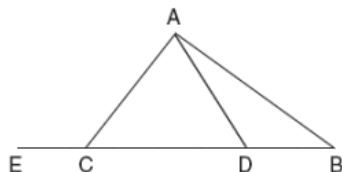
Part I: Multiple Choice

1. In two similar triangles, the ratio of the lengths of a pair of corresponding sides is 7:8. If the perimeter of the larger triangle is 32, find the perimeter of the *smaller* triangle.
 [1] 8 [2] 16 [3] 21 [4] 28

2. Which of the following statements is NOT true about the centroid of a triangle?
 [1] The centroid of a triangle is point where the medians of the triangle are concurrent.
 [2] The centroid of a triangle may be located inside the triangle, on a side of the triangle, or outside of the triangle.
 [3] The centroid of a triangle divides the medians of the triangle into a ratio of 2:1.
 [4] The centroid of a triangle is the center of gravity of a triangular shape of uniform thickness and density.

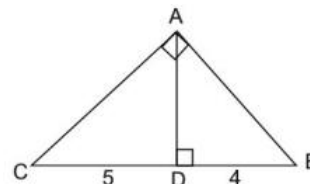
3. Point $C(3,4)$ is the midpoint of \overline{AB} . If the coordinates of A are $(7,6)$, the coordinates of B are:
 [1] $(-1,2)$ [3] $(5,5)$
 [2] $(2,1)$ [4] $(11,8)$

4. In $\triangle ABC$, \overline{BC} is extended to E , and D is a point on \overline{BC} .
 [1] $m\angle ADE > m\angle ABC$
 [2] $m\angle ADE = m\angle ABC$
 [3] $m\angle ACB = m\angle ABC$
 [4] $m\angle ABC > m\angle ADE$



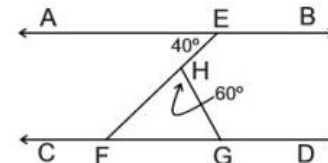
5. If the lengths of two sides of a triangle measure 7 and 15, then the length of the third side could measure:
 [1] 7 [2] 8 [3] 11 [4] 24

6. In the accompanying diagram of right triangle ABC , altitude \overline{AD} divides hypotenuse \overline{BC} into segments with lengths of 4 and 5. Find the length of leg \overline{AB} .



- [1] 4.5
 [2] $2\sqrt{5}$
 [3] 6
 [4] 7.5

7. In the accompanying diagram, $\overline{AB} \parallel \overline{CD}$, \overline{FHE} , $m\angle AEF = 40^\circ$, and $m\angle FHG = 60^\circ$. Find $m\angle HGD$.



- [1] 95° [3] 120°
 [2] 100° [4] 140°

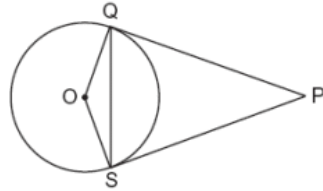
8. If the measures of three angles of a triangle are represented by $(y + 30)^\circ$, $(4y + 30)^\circ$, and $(10y - 30)^\circ$, then the triangle must be:
 [1] obtuse [2] isosceles [3] scalene [4] right

9. The number of points equidistant from two parallel lines and also equidistant from two points on one of the given lines is *exactly*:
 [1] 1 [2] 2 [3] 3 [4] 4

10. The lengths of the bases of an isosceles trapezoid are 6 centimeters and 12 centimeters. If the length of each leg is 5 centimeters, what is the area of the trapezoid?

[1] 18 cm^2 [2] 36 cm^2 [3] 45 cm^2 [4] 90 cm^2

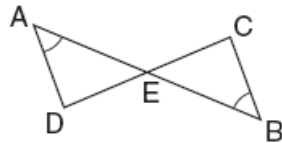
11. In the accompanying diagram, \overline{PQ} and \overline{PS} are tangents drawn to circle O , and chord \overline{QS} is drawn. If $m\angle P = 40^\circ$, what is $m\angle PQS$?



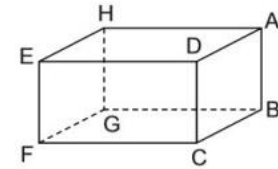
[1] 140° [3] 70°
 [2] 80° [4] 60°

12. Which statement is logically equivalent to “If Andrea gets a job, she buys a new car”?
- [1] Andrea gets a job and she buys a new car.
 [2] If Andrea does not buy a new car, she does not get a job.
 [3] If Andrea does not get a job, she does not buy a new car.
 [4] If Andrea buys a new car, she gets a job.

13. In the accompanying diagram, \overline{AB} and \overline{CD} intersect at E , E is the midpoint of \overline{AB} , and $\angle A \cong \angle B$. Which statement can be used to prove that $\triangle ADE \cong \triangle BCE$?
- [1] ASA (Angle-Side-Angle)
 [2] HL (Hypotenuse-Leg)
 [3] SSS (Side-Side-Side)
 [4] SAS (Side-Angle-Side)

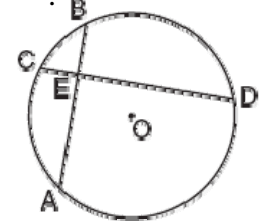


14. For this rectangular solid, which plane(s) contain D and are parallel to plane FEH ?



[1] planes DAB and HAD [3] planes DCB and FCB
 [2] only plane DAB [4] only plane HAD

15. In the accompanying diagram of circle O , chords \overline{AB} and \overline{CD} intersect at E and $m\widehat{AC} : m\widehat{CB} : m\widehat{BD} : m\widehat{DA} = 4 : 2 : 6 : 8$. What is the $m\angle DEB$?



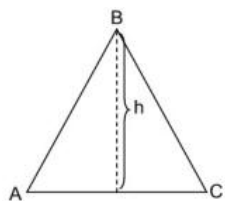
[1] 36°
 [2] 90°
 [3] 100°
 [4] 126°

16. The sum of the measures of the interior angles of a regular pentagon is:
- [1] 180° [2] 360° [3] 540° [4] 720°

17. Which statement is *false* about the line whose equation is $y = -2x - 5$?
- [1] Its slope is -2 .
 [2] It is parallel to the line whose equation is $y = 2x + 5$.
 [3] Its y-intercept is -5 .
 [4] It is perpendicular to the line whose equation is

$$y = \frac{1}{2}x - 5$$

18. In the accompanying diagram, ABC is an equilateral triangle with a perimeter of 30. What is the length of altitude h of this triangle?



- [1] $5\sqrt{2}$
 [2] $5\sqrt{3}$
 [3] $10\sqrt{2}$
 [4] $10\sqrt{3}$
19. Which of the following points is a solution to the system $y = 4 - x$ and $y = -x^2 + 2x + 4$?

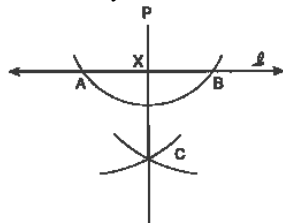
- [1] (1,3) [2] (4,1) [3] (-1,-3) [4] (3,1)

20. Which equation represents a circle with center (1,-3) and radius 4?

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

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

21. The diagram at the right shows the construction of a perpendicular, \overline{PX} , to a line l from point P . The arc drawn from point P intersects line l at A and B , and the arcs drawn from points A and B intersect \overline{PX} at C . Which of the statements is *not always* true about this construction?



- [1] $PA = PB$
 [2] $AX = BX$
 [3] $PX = CX$
 [4] $AC = BC$

22. The distance between points $(4a, 3b)$ and $(3a, 2b)$ is
 [1] $a^2 + b^2$ [2] $\sqrt{a^2 + b^2}$ [3] $a + b$ [4] $\sqrt{a + b}$

23. A translation maps (x, y) to $(x - 5, y + 3)$. In which quadrant does the point $(-3, -2)$ lie under the same translation?
 [1] I [2] II [3] III [4] IV

24. What is the equation of a line that passes through the point $(-3, 2)$ and is parallel to the line $2x - 3y = 12$?

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

[2] $y = \frac{2}{3}x + 1$ [4] $y = -\frac{3}{2}x + \frac{13}{2}$

25. The sentence "If _____, then $6 + 3 = 9$." is TRUE. Which of the following statements could be used to fill the blank and maintain the truth value of the sentence?

[1] $10/5 = 2$

[2] $12/3 = 6$

[3] both choice [1] and choice [2] could be used

[4] neither choice [1] nor choice [2] could be used

26. A triangle has vertices $A(3, 2)$, $B(4, 1)$ and $C(4, 3)$. What are the coordinates of point B under the glide reflection

$T_{(0, 1)} \circ r_{x=0}$.

[1] (2, -4)

[3] (4, 2)

[2] (4, 0)

[4] (-4, 2)

27. The sphere appears in nature whenever a surface wants to be as small as possible. For this problem, assume that a bubble is a sphere. If the diameter of the bubble is known to be 2 mm, what is the surface area of the bubble to the *nearest square mm* ?
[1] 13 [2] 25 [3] 28 [4] 52

28. Under a dilation of scale factor 3 with the center at the origin, what will be the coordinates of the image of point $B(2,3)$?
[1] (6,3) [2] (2,9) [3] (5,6) [4] (6,9)