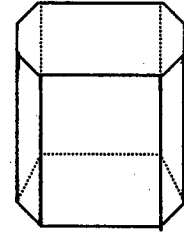


Level 1 (Geometry) Blitz 2007

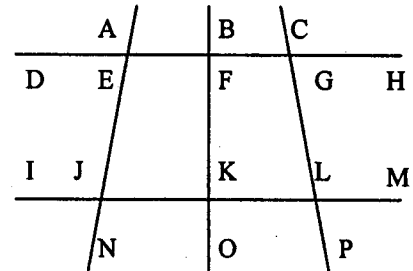
1. The figure shown is a right prism whose bases are regular octagons. Find the measure of the dihedral angle between adjacent lateral faces.

- a. 120° b. 45° c. 135° d. 90° e. none of these



2. Line DH is parallel to line IM. Line BO is perpendicular to line DH. Which of the following statements is true?

- a. $\angle FGL$ and $\angle LGH$ are complementary
 b. $m\angle PLM + m\angle LGH = 180^\circ$
 c. $m\angle JEF = m\angle LGH$
 d. $\angle FGL$ and $\angle GLK$ are supplementary
 e. none of these



3. The diagonals of a ? intersect at their common midpoint.

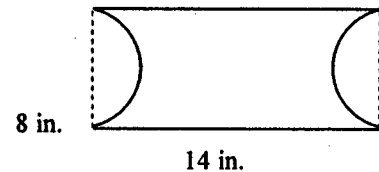
- a. pentagon b. rhombus c. trapezoid
 d. parallelogram e. none of these

4. A tree casts a shadow 32 m long. At the same time, the shadow cast by a 45 cm tall statue is 80 cm long. Find the height of the tree.

- a. 62 m b. 19 cm c. 18 cm
 d. 59 m e. none of these

5. Find the area of the figure on the right with the semicircles removed from each end of the rectangle:

- a. $112 - 16\pi \text{ in}^2$ b. $112 - 4\pi \text{ in}^2$
 c. $112 - 64\pi \text{ in}^2$ d. $112 - 8\pi \text{ in}^2$ e. none of these



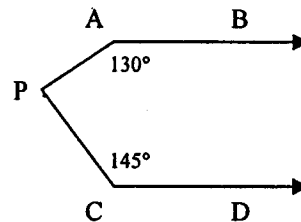
6. A square with sides of length 30 is inscribed by a circle and circumscribed by another circle. What is the area between the circles?

- a. 450π b. 225π c. 15π
 d. 450 e. none of these

7. Fifteen smaller spherical water balloons are all full of water. The contents of all fifteen of these smaller water balloons are being used to fill one larger spherical water balloon. If each of the smaller spherical balloons has a diameter of 2 inches, what is the diameter of the new larger spherical balloon?
- a. 5 inches b. 30 inches c. 15 inches
d. 10 inches e. none of these

8. Find the measure of $\angle P$ if lines AB and CD are parallel

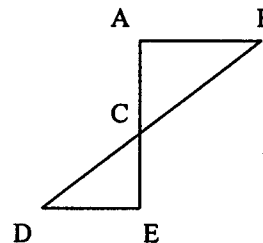
- a. 85° b. 137.5° c. 90°
d. 65° e. none of these



9. Find the volume of the feed bin having the shape of a right circular cylinder of radius 8 feet and height 6 feet topped by a right circular cone of the same radius and height 3 feet.
- a. 512 ft^3 b. $576\pi \text{ ft}^3$ c. $512\pi \text{ ft}^3$ d. $533.\bar{3}\pi \text{ ft}^3$
e. none of these

10. Line AE is perpendicular to lines AB and DE, $AB = 6 \text{ cm}$, $DE = 4 \text{ cm}$, and $AE = 5 \text{ cm}$. Find the length of CE.

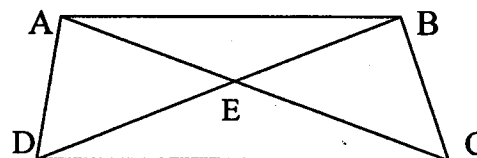
- a. 4 cm b. 3 cm c. 2 cm
d. 1 cm e. none of these



11. A goat is tethered at the outside corner of an 80-foot by 30-foot rectangular barn. If the rope is 50 feet long, find the area of the region that the goat can reach.
- a. $2500\pi \text{ ft.}^2$ b. $1975 \pi \text{ ft.}^2$ c. 2500 ft.^2 d. $1875 \pi \text{ ft.}^2$
e. none of these

12. The diagonals of a trapezoid ABCD intersect at E, where line AB is parallel to line DC. The lengths of the line segments are as follows: length of $AE = 17$, length of $DE = 36$, length of $AB = 26$, and length of $EC = 51$. Determine the length of DC.

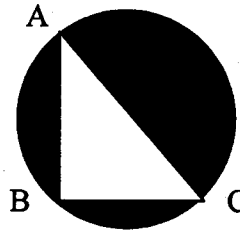
- a. 46 b. 78 c. 12
d. 72 e. none of these



13. Which statement is true?
- a. All parallelograms are rhombuses. b. All quadrilaterals are parallelograms.
 c. All squares are rectangles. d. All rhombuses are squares.
 e. none of these

14. If the radius of a sphere is doubled, the volume is made
- a. 16 times as great b. 8 times as great c. 4 times as great
 d. 2 times as great e. none of these

15. Given the length of $AB = 8$, the length of $BC = 6$, and AC is a diameter of the circle. Find the area of the shaded region on the right.

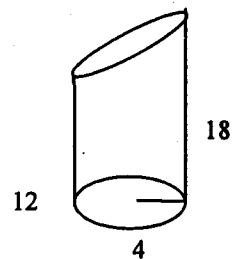


- a. $9\pi - 48$ b. $16\pi - 48$ c. $16\pi - 24$
 d. $25\pi - 24$ e. none of these

16. A grapefruit has an outside diameter of 10 inches. When cut open, it is discovered that the peel is 1 inch thick. What approximate percentage of the grapefruit's volume is the peel? (Assume the thickness of the peel is uniform throughout the grapefruit.)

- a. 10% b. 20% c. 40% d. 50% e. none of these

17. A cylinder is cut on a slant as shown. The height goes from 12 cm to 18 cm and the radius of the circular base is 4 cm. Find the volume.



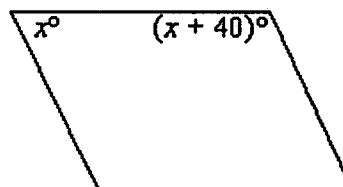
- a. $260\pi \text{ cm}^3$ b. $156\pi \text{ cm}^3$ c. $240\pi \text{ cm}^3$
 d. $250\pi \text{ cm}^3$ e. none of these

18. Each interior angle of a regular hexagon has a measure of
- a. 60° b. 120° c. 75° d. 100° e. none of these

19. How many different chords are determined by n distinct points lying on a circle?

- a. $n(n-3)$ b. $n(n+3)$ c. n^2-3 d. $\frac{n^2-n}{2}$
 e. none of these

20. What value of x will make the quadrilateral a parallelogram?

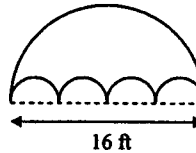


- a. 60 b. 70 c. 80
 d. 110 e. none of these

27. One diagonal of a rhombus contains the vertices $(-4, -1)$ and $(7, -2)$. The slope of the other diagonal is:

- a. -11 b. $-\frac{1}{11}$ c. 1 d. -1 e. none of these

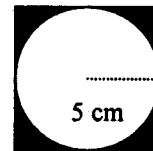
28. The region on the right represents a larger semicircle with four smaller semicircles removed from the region. Each of the smaller semicircles has the same diameter. Find the area of the closed region.



- a. $48\pi \text{ ft}^2$ b. $24\pi \text{ ft}^2$ c. $32\pi \text{ ft}^2$
 d. $64\pi \text{ ft}^2$ e. none of these

29. The area of the shaded region to the right is:

- a. 100 cm^2 b. $(100 - 6.25\pi) \text{ cm}^2$
 c. $(25 - 6.25\pi) \text{ cm}^2$ d. $25\pi \text{ cm}^2$ e. none of these



30. A room measures 4 m by 6 m and the ceiling is 3 m high. One liter of paint covers 12 m^2 . Then the number of liters it will take to paint all, but the floor of the room is:

- a. 7 liters b. 5 liters c. 68 liters d. 84 liters
 e. none of these

31. A water tank in the shape of an inverted cone has a radius of 5 m and a height of 15 m. The volume of the water in the tank to the nearest m^3 when the water is 6 m deep is:
 (Use $\pi = 3.14$ as an estimate)

- a. 25 m^3 b. 6 m^3 c. 75 m^3
 d. 13 m^3 e. none of these

32. A girl flying a kite lets out all 120 feet of the string. If the string forms an angle of 30° with the level ground, then the height of the kite at that moment is:

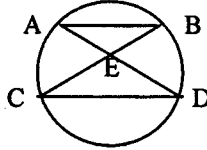
- a. 120 ft b. $60\sqrt{3}$ ft c. 60 ft d. 90 ft
 e. none of these

33. The area of an equilateral triangle with sides measuring x in length is:

- a. $3x$ b. $\frac{1}{4}x^2$ c. $\frac{\sqrt{3}}{4}x^2$ d. $\frac{\sqrt{3}}{8}x^2$ e. none of these

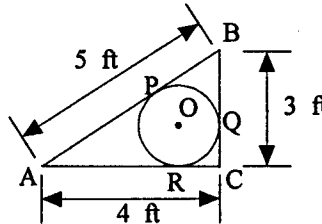
Use this information for problems 34 and 35.

Given the measure of $\angle ADC = 30^\circ$ and $\overline{AB} \parallel \overline{CD}$.



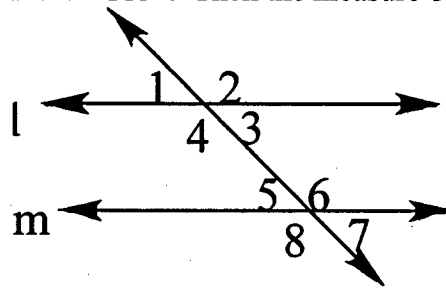
34. The measure of $\angle AEB$ is:
- a. 30° b. 60° c. 90° d. 120° e. none of these
35. If the measure of arc $CD = 2(\text{measure of arc } AB)$, then the measure of arc CD is:
- a. 110° b. 220° c. 30° d. 60° e. none of these

36. The sides of $\triangle ABC$ are each tangent to circle O which is inscribed in $\triangle ABC$. Points P , Q , and R are points of tangency, then the length of \overline{AR} is:

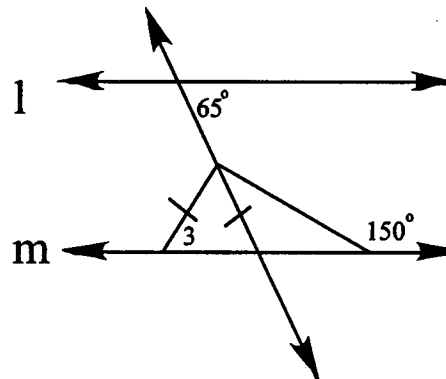


- a. 2 ft b. 3 ft c. 5 ft
- d. 10 ft e. none of these
37. The length of one side of a rhombus is 7 in. The perimeter of the rhombus is:
- a. 14 in b. 28 in c. 21 in d. 49 in e. none of these
38. The length of a rectangle is 6 in. less than twice its width. If the perimeter of the rectangles is 72 in., then the length of the rectangle is:
- a. 14 in b. 26 in c. 22 in d. 18 in e. none of these
39. If the length and width of a rectangle are both multiplied by n , then the area of the rectangle is multiplied by:
- a. n b. $2n$ c. $4n$ d. n^2 e. none of these

40. In the diagram below, line $l \parallel$ line m and $\angle 4 = 115^\circ$. Then the measure of $\angle 7$ is:

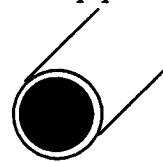


- a. 115° b. 180° c. 60° d. 65° e. none of these
41. In the diagram below, line $l \parallel$ line m and congruent segments are marked. Then the measure of $\angle 3$ is:

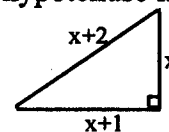


- a. 115° b. 150° c. 65° d. 30° e. none of these
42. A water pipe with diameter 4 in. is to be replaced by smaller 2 in. pipes. The number of 2 in. pipes that will carry as much water as the 4 in. pipes is:

- a. 1 b. 2 c. 3 d. 5
- e. none of these



43. In the diagram of the triangle to the right, the length of the hypotenuse is:



- a. 3 b. 5 c. 4 d. 2 e. none of these

44. The statement that is true about trapezoids is:

- a. Both pairs of opposite sides are always congruent.
- b. The diagonals always bisect each other.
- c. A diagonal always forms congruent triangles.
- d. There are at least two consecutive supplementary angles.
- e. none of these

45. The statement that is true about parallelograms is:

- a. All four sides are always congruent.
- b. Always has at least one right angle.
- c. Always has at least two consecutive congruent angles.
- d. Diagonals are always congruent.
- e. none of these