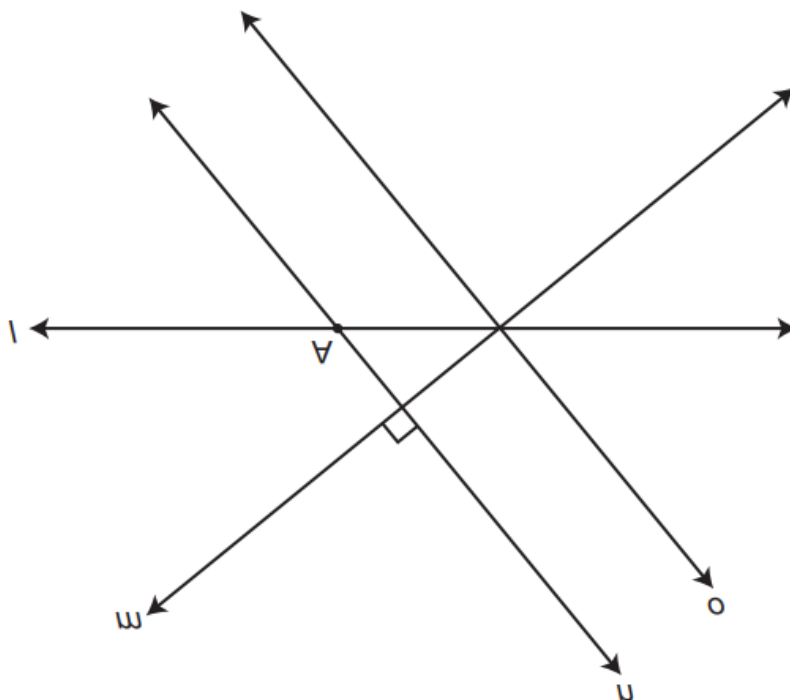


Directions: Choose the letter that corresponds to the correct answer.

1. A farmer has a rectangular field that measures 125 feet by 200 feet. He wants to enclose the field with a fence. What is the total length, in feet, he will need for the job?

- A. 450
- B. 550
- C. 650
- D. 750

Use the following diagram to answer questions 2 to 7:



2. How many lines can be drawn through $\bullet A$ that are parallel to line m ?

- A. 0
- B. 1
- C. 2

D. Infinite

3. How many lines can be drawn through $\bullet A$ that are perpendicular to line l ?

A. 0

B. 1

C. 10,000

D. Infinite

4. Which lines are perpendicular?

A. n , m

B. o , l

C. l , n

D. m , l

5. How many points do line m and line l share?

A. 0

B. 1

C. 2

D. Infinite

6. $\bullet A$ is

A. between lines l and n .

B. on lines l and n .

C. on line l , but not line n .

D. on line n , but not line l .

7. Which set of lines are transversals?

A. l , m , o

B. o , m , n

C. l , o , n

D. l , m , n

8. The triangle ABC that is provided has side lengths of a , b , and c feet and is not a right triangle. Let A' be the image when the triangle is reflected across side BC. Which of the following is an expression for the perimeter, in feet, of quadrilateral $A'BAC$?

- A. $2(a + b)$
- B. $2(b + c)$
- C. $a + b + 2c$
- D. $2ab$

9. What would be the height of a trapezoidal building if, at its base, it measured 80 feet, its roofline measured 40 feet, and the surface area of one side was $7,200 \text{ ft}^2$?

- A. 112 ft.
- B. 150 ft.
- C. 120 ft.
- D. 135 ft.

10. The volume of a cylindrical aquarium tank is 13,565 cubic feet. If its radius is 12 feet, what is its height to the nearest foot?

- A. 73 feet.
- B. 27 feet.
- C. 42 feet.
- D. 30 feet.

11. A cylinder has a surface area of 2,512 square feet. The height of the cylinder is three times the radius of the base of the cylinder. Find the radius and the height of the cylinder.

- A. $r = 5$ feet; $h = 15$ feet
- B. $r = 10$ feet; $h = 30$ feet
- C. $r = 15$ feet; $h = 45$ feet
- D. $r = 20$ feet; $h = 60$ feet

12. Which of the following angle measurements would not describe an interior angle of a right angle?

- A. 30°
- B. 60°
- C. 90°
- D. 100°



**UPCAT
Mathematics
Practice Questions**

Set 2

13. A 20 ft. beam leans against a wall. The beam reaches the wall 13.9 ft. above the ground. What is the measure of the angle formed by the beam and the ground?

- A. 44°
- B. 35°
- C. 55°
- D. 46°

14. The lines $y = 2x$ and $2y = -x$ are

- A. parallel
- B. perpendicular
- C. horizontal
- D. vertical

15. Three concentric circles whose radii are in the ratio 2:3:5. If the area of the smallest circle is 36π , what would be the area of the largest circle?

- A. 75π
- B. 81π
- C. 100π
- D. 225π

16. Which choice below has the most points?

- A. a line
- B. a line segment
- C. a ray
- D. No determination can be made.

17. Lines are always

- A. solid.
- B. finite.
- C. noncollinear.
- D. straight.

18. Collinear points



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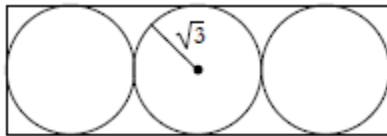
To God be the glory!

- A. determine a plane.
- B. are circular.
- C. are noncoplanar.
- D. are coplanar.

19. The shortest distance between any two points is

- A. a plane.
- B. a line segment.
- C. a ray.
- D. an arch.

20. Find the area of the rectangle below.



- A. $12\sqrt{3}$
- B. 36
- C. 24
- D. 18

Answer questions number 21 to 25 using the description below.

Ann, Bill, Carl, and Dan work in the same office building. Dan works in the basement while Ann, Bill, and Carl share an office on level X. At any given moment of the day, they are all typing at their desks. Bill likes a window seat; Ann likes to be near the bathroom; and Carl prefers a seat next to the door. Their three cubicles do not line up.

21. Level X can also be called

- A. Plane Ann, Bill, and Carl.
- B. Plane Ann and Bill.
- C. Plane Dan.
- D. Plane Carl, X, and Bill.

22. If level X represents a plane, then level X has

- A. no points.

- B. only three points.
- C. a finite set of points.
- D. an infinite set of points extending infinitely.

23. If Ann and Bill represent points, then Point Ann

- A. has depth and length, but no width; and is noncollinear with point Bill.
- B. has depth, but no length and width; and is noncollinear with point Bill.
- C. has depth, but no length and width; and is collinear with point Bill.
- D. has no depth, length, and width; and is collinear with point Bill.

24. If Ann, Bill, and Carl represent points, then Points Ann, Bill, and Carl are

- A. collinear and noncoplanar.
- B. noncollinear and coplanar.
- C. noncollinear and noncoplanar.
- D. collinear and coplanar.

25. A line segment drawn between Carl and Dan is

- A. collinear and noncoplanar.
- B. noncollinear and coplanar.
- C. noncollinear and noncoplanar.
- D. collinear and coplanar.

26. The semicircle of area 1250 pi centimeters is inscribed inside a rectangle. The diameter of the semicircle coincides with the length of the rectangle. Find the area of the rectangle.

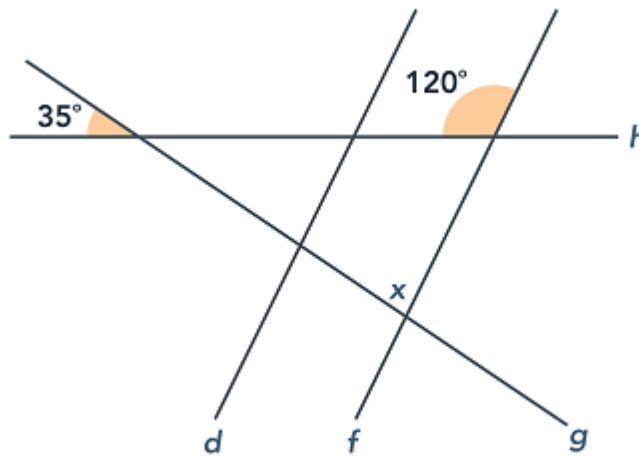
- A. 1500
- B. 5000
- C. 4500
- D. 2500

27. The circumference of a large wedding cake is 60 inches. If the cake is divided evenly into 12 slices, what is the length of the arc, in inches, made by 5 combined slices?

- A. 10

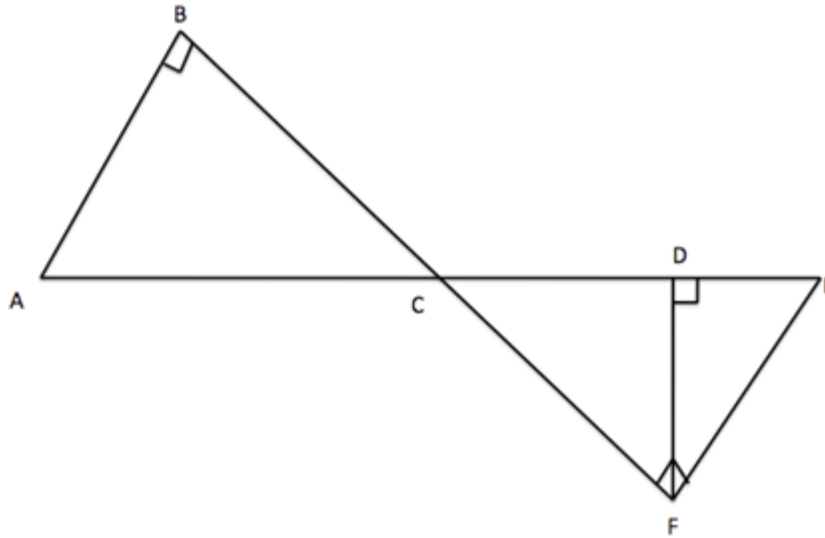
- B. 15
- C. 20
- D. 25

28. In the figure below, lines d and f are parallel and the angle measures are as given. What is the value of x ?



- A. 35
- B. 60
- C. 85
- D. 100

29. In the figure below, $A, C, D,$ and E are collinear; $B, C,$ and F are collinear; and the angles at $B, D,$ and F are right angles, as marked. Which of the following statements is NOT justifiable from the given information?



- A. AB is parallel to EF.
- B. BC is congruent to CF.
- C. EF is perpendicular to BF.
- D. Triangle BAC is similar to triangle DCF.

30. A triangle is composed of angles represented as: $3x + 10$, $-2x + 40$, and $x + 40$. What is the value of x ?

- A. 45
- B. 50
- C. 55
- D. 60

31. The diameter of a sphere measures 5 inches. If a cube is inscribed inside the sphere, sharing its diagonal with the sphere's diameter, what is the side length of the cube?

- A. $5\sqrt{3}$ in.
- B. $\frac{5\sqrt{3}}{3}$ in.
- C. $\frac{3\sqrt{5}}{3}$ in.
- D. $3\sqrt{6}$ in.

32. Two side lengths of a triangle are 5 and 6, which of the following CANNOT be the length of the third side?

- A. 3
- B. 6
- C. 9
- D. 12

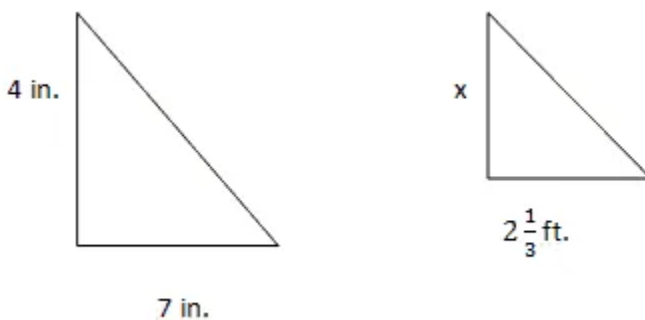
33. The coordinates $(-3, 5)$ and $(3, 5)$ designate the diameter of a circle, what is its circumference?

- A. 2π
- B. 4π
- C. 6π
- D. 8π

34. Which of the following statements is true?

- A. The diagonals of a rhombus are congruent.
- B. All rectangles are similar.
- C. All rectangles are rhombuses.
- D. Some rhombuses are rectangles.

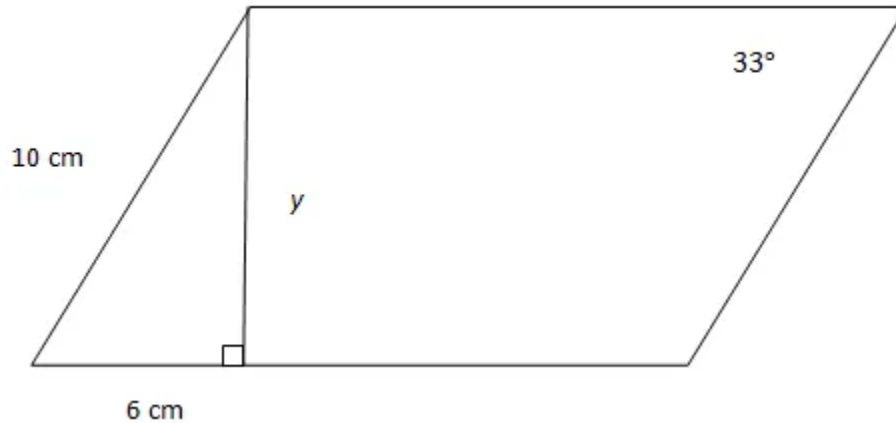
35. In order for the two triangles shown to be similar, what is one possible value for x ?



- A. 8 in.
- B. 10 in.
- C. 16 in.

D. 20 in.

36. In the figure below, what is the length of altitude y ?



- A. 7 cm.
- B. 8 cm.
- C. 9 cm.
- D. 10 cm.

37. Which of the following sets of interior angle measures would describe an acute isosceles triangle?

- A. 90° , 45° , 45°
- B. 80° , 60° , 60°
- C. 60° , 60° , 60°
- D. 60° , 50° , 50°

38. Which trigonometric function can equal or be greater than 1.000?

- A. Sine
- B. Cosine
- C. Tangent
- D. none of the above