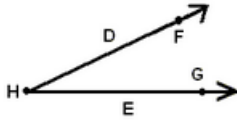


# Geometry

1. Which of the following letters represents the vertex in the following picture?



D and E

E and H

F and G

G only

H only

2. If a circle has the diameter of 8, what is the circumference?

6.28

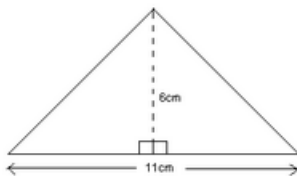
12.56

25.13

50.24

100.48

3. What is the area of the triangle below?



22 cm<sup>2</sup>

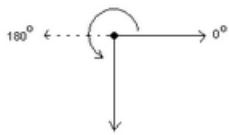
33 cm<sup>2</sup>

44 cm<sup>2</sup>

50 cm<sup>2</sup>

66 cm<sup>2</sup>

4. What is the measure of the solid line angle depicted by the following figure?



90 degrees

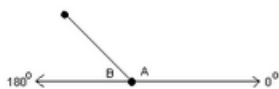
180 degrees

225 degrees

270 degrees

0 degrees

5. What is the measure of angle B in the following figure if angle A measures 135°?



40°

45°

50°

135°

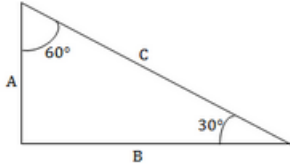
225°

## Answers & Explanations

1. E: The vertex is the point, formed by the two rays of an angle. Thus, H is the vertex of the angle.
2. C:  $C = \pi d$ . Substituting 8 for  $d$  gives  $C = 8\pi$ , where  $C$  is approximately 25.13.
3. B: The area of a triangle may be found by using the formula,  $A = \frac{1}{2}bh$ , where  $b$  represents the base and  $h$  represents the height. Thus, the area may be written as  $A = \frac{1}{2}(11)(6)$ , or  $A = 33$ . The area of the triangle is 33 cm'.
4. D: The sum of the angles, formed by the perpendicular rays is  $360^\circ$ , thus the curved arrow represents an angle measure that is equal to the difference of  $360^\circ$  and  $90^\circ$ , or  $270^\circ$ .
5. B: Since angles A and B are supplementary, the measure of angle B is equal to the difference of  $180^\circ$  and  $135^\circ$ , or  $45^\circ$ .

## Additional Geometry

1. Given the triangle shown in the figure, what is the length of the side A?



$C/2$

$A/2$

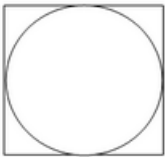
$(A+C)/2$

$2A$

$2C$

ACT Test Study Guide with Practice Questions

2. A circle is inscribed within a square, as shown. What is the difference between the area of the square and that of the circle, where  $r$  is the radius of the circle?



$2\pi r^2$

$\frac{4}{3}\pi r^3$

$r^2(4-\pi)$

$2\pi r$

$2r^2$

3. Two angles of a triangle measure 15 and 70 degrees, respectively. What is the size of the third angle?

90 degrees

80 degrees

75 degrees.

125 degrees

95 degrees

4. A rectangle is divided into two squares, each with a perimeter of 20. What is the perimeter of the rectangle?

20

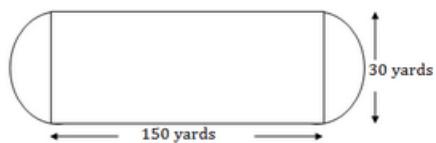
30

40

50

60

5. The diagram shows the outline of a racetrack for skaters, which consists of two long straight sections and two semi-circular turns. Given the dimensions shown, which of the following most closely measures the perimeter of the entire track?



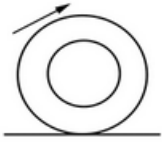
180 yards

360 yards

395 yards

425 yards

6. A tire on a car rotates at 500 RPM (revolutions per minute) when the car is traveling at 50 km/hr (kilometers per hour). What is the circumference of the tire, in meters?



$50,000/2\pi$

$50,000/(60 \cdot 2\pi)$

$50,000/(500 \cdot 2\pi)$

$50,000/60$

$10/6$

7. Which of the following expressions represents the ratio of the area of a circle to its circumference?

$\pi r^2$

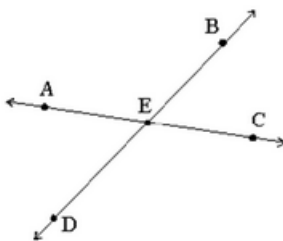
$\pi r^2/2\pi$

$2\pi r/r^2$

$2\pi r^{1/2}$

$r/2$

8. Lines AC and BD intersect at point E. Angle BEC is 45°. What is the measure of angle AEB?



Angle AEB is 90°

Angle AEB is 115°

Angle AEB is 135°

Angle AEB is 1800

Angle AEB is 3600

9. Which of the following are complementary angles?

710 and 190

180 and 180

900 and 900

900 and 450

150 and 300

10. Which of the following letters has a vertical line of symmetry?

A

B

C

D

E

Answers and Explanations

1. A: Since the two angles shown add up to 90 degrees, and the remaining angle must therefore be 90 degrees, this is a right triangle. For a right triangle, the length of a side is related to the hypotenuse by the sine of the opposite angle. Thus,  $A = C \sin(30^\circ)$  and since the sine of a 30-degree angle is 0.5 or  $1/2$ ,  $A = C/2$ .

2. C: The side of the square is equal to the diameter of the circle, or twice the radius:  $2r$ . The area of the square is this quantity  $2r$  squared, or  $4r^2$ . The area of the circle is  $\pi r^2$ . Subtracting gives the difference between the two areas:  $4r^2 - \pi r^2 = r^2(4 - \pi)$

3. E: The sum of angles in a triangle equals 180 degrees. Therefore, solve for the remaining angle by subtracting the sum of the two given angles from 180 degrees:  $180 - (15 + 70) = 95$  degrees.

4. B: The perimeter of a square is four times the length of any one of its sides. If a square's perimeter is 20, the length of any side is 5. The perimeter of the rectangle described in this problem is six times the length of a side of the square, which is  $6 \cdot 5 = 30$ .

5. C: First, add the two straight 150 yard portions. Also, note that the distance around the two semi-circle turns combine to form the circumference of a circle. The radius ( $r$ ) of that circle is half of the dimension shown as the width of the track, or 15 yards. Now, taking the formula for the circumference of a circle,  $2\pi r$  (with  $r = 15$ ), and adding it to the length of the two straight portions of the track, we have:  $\text{Length} = (2\pi \cdot 15) + (2 \cdot 150) = 394.25$ .

6. E: It is not necessary to use the circle circumference formula to solve the problem. Rather, note that 50 km/hr corresponds to 50,000 meters per hour. We are given the car tire's revolutions per minute and the answer must be represented as meters; therefore, the speed must be converted to meters per minute. This corresponds to a speed of meters 50,000/60 per minute, as there are 60 minutes in an hour. In any given minute, the car travels 50,000/60 meters/min, and each tire rotates 500 times around, or 500 times its circumference. This corresponds to  $50,000 / (60 \cdot 500) = 10/6$  meters per revolution, which is the circumference of the tire.

7. E: The area of the circle is  $\pi r^2$  while the circumference is  $2\pi r$ . Taking the ratio of these two expressions and reducing gives:  $\text{io} = (\pi r^2) / 2\pi r = r/2$ .

8. C: Note that angles AEB and BEC are supplementary and so their sum is 1800. Subtract to solve:  $1800 - 450 = 1350$ .

9. A: Complementary angles are two angles that equal 900 when added together.

10. A: If you draw a vertical line down the center of the letter A, the two sides will be symmetrical