



# MATHS

## BOOKS - PRINCETON MATHS (ENGLISH)

### GEOMETRY

#### Example

1. In  $\triangle ABC$  (not shown),  
 $\angle ABC = 60^\circ$  and  $AC \perp BC$ . If  $AB = x$ ,

then what is the area of  $\triangle ABC$ , in terms of  $x$ ?

A.  $\frac{x^2\sqrt{3}}{8}$

B.  $\frac{x^2\sqrt{3}}{4}$

C.  $\frac{x^2\sqrt{3}}{2}$

D.  $x^2\sqrt{3}$

**Answer: A**



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2.  $\frac{54}{7}\pi$  radians is approximately equal to how many degrees?

A.  $8^\circ$

B.  $694^\circ$

C.  $1,389^\circ$

D.  $2,777^\circ$

**Answer: C**



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3. In  $\triangle ABC$  (not shown),

$AC \perp BC$  and  $\cos \angle ABC = \frac{12}{13}$ . What is the

value of  $\tan \angle ABC$ ?

A.  $\frac{5}{13}$

B.  $\frac{5}{12}$

C.  $\frac{12}{13}$

D.  $\frac{12}{5}$

**Answer: B**



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4. Point A and B lie on circle O (not shown),  $AO=3$  and  $\angle AOB = 120^\circ$ . What is the area of minor sector AOB?

A.  $\frac{\pi}{3}$

B.  $\pi$

C.  $3\pi$

D.  $9\pi$

**Answer: C**



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5. If the perimeter of a square is 28, what is the length of the diagonal of the square?

A.  $2\sqrt{14}$

B.  $7\sqrt{2}$

C.  $7\sqrt{3}$

D. 14

**Answer: B**



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6. A sphere has a volume of  $36\pi$ . What is the surface area of the sphere? (The surface area of a sphere is given by the formula  $A = 4\pi r^2$ )

A.  $3\pi$

B.  $9\pi$

C.  $27\pi$

D.  $36\pi$

**Answer: D**



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7. The base of triangle T is 40 percent less than the length of rectangle R. The height of triangle T is 50 percent greater than the width of rectangle R. The area of triangle T is what percent of the area of rectangle R?

A. 10

B. 45

C. 90

D. 110

**Answer: B**





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## Geometry Drill 2 Calculator Permitted Section

1. If a rectangular swimming pool has a volume of 16,500 cubic feet, a uniform depth of 10 feet, and a length of 75 feet, what is the width of the pool, in feet?

A. 22

B. 26

C. 32

D. 110

**Answer: A**



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2. A toy pyramid (not shown) is made from poly(methyl methacrylate), better known by its trade term Lucite. The toy pyramid has a regular hexagonal base of  $15\text{cm}^2$  and a height of 4 cm. In the base of the pyramid, there is a semispherical indentation 2 cm in diameter. If

the pyramid weighs 21.129 g, then what is the density of Lucite? (Density equals mass divided by volume).

A.  $1.06 \text{ g/cm}^3$

B.  $1.18 \text{ g/cm}^3$

C.  $2.0 \text{ g/cm}^3$

D.  $6.51 \text{ g/cm}^3$

**Answer: B**



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3. If a rectangular swimming pool has a volume of 16,500 cubic feet, a uniform depth of 10 feet, and a length of 75 feet, what is the width of the pool, in feet?

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B. 26

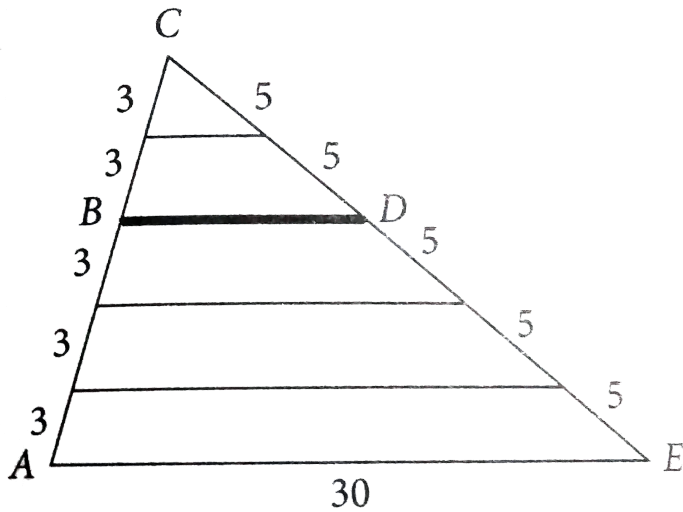
C. 32

D. 110

**Answer: A**



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4.

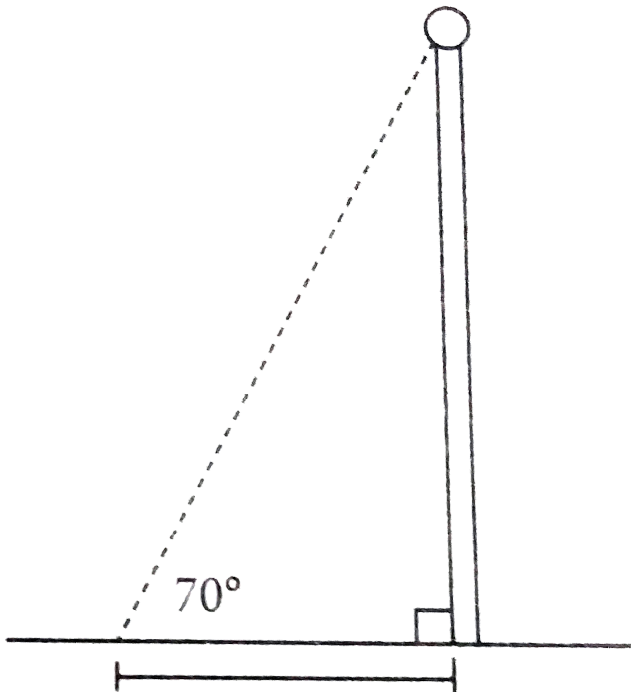
In the figure above, what is the length of  $\overline{BD}$ ?

- A. 8
- B. 9
- C. 12
- D. 15

Answer: C



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5.

10 m

Martin wants to know how tall a certain

flagpole is. Martin walks 10 meters from the flagpole, lies on the ground, and measures an angle of  $70^\circ$  from the ground to the base of the ball at the top of the flagpole. Approximately how tall is the flagpole from the ground to the base of the ball at the top of the flagpole?

A. 3m

B. 9m

C. 27m

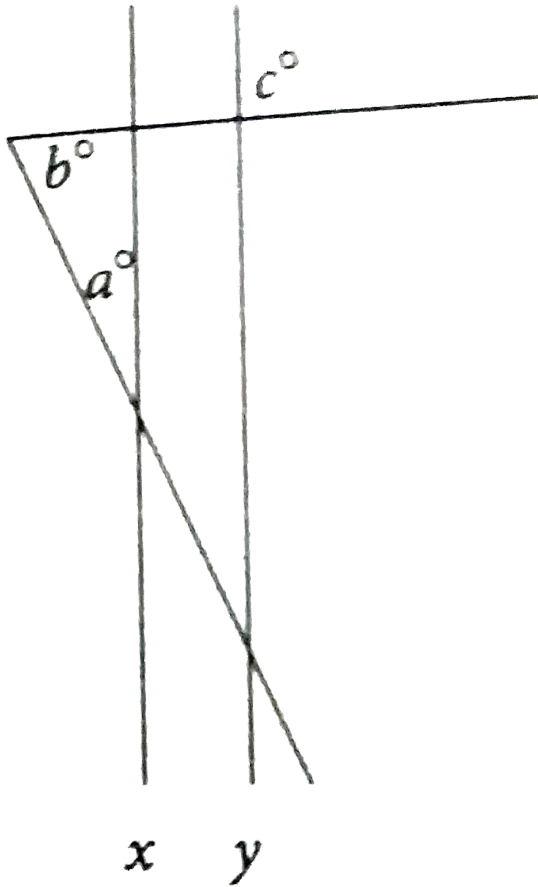
D. 29m

**Answer: C**



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6.

In the figure above,  $x \parallel y$ . What is the value of  $a$ ?

A.  $b+c$

B.  $2b-c$

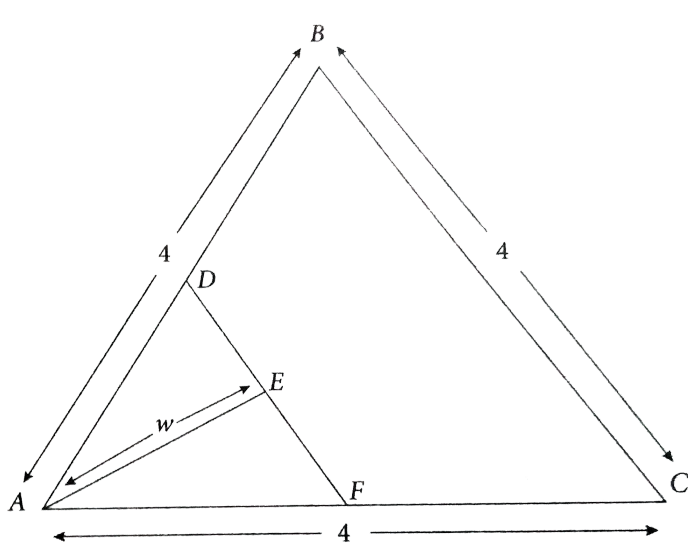
C.  $180-b+c$

D.  $180-b-c$

**Answer: D**



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7.

$\triangle ABC$  is equilateral and  $\angle AEF$  is a right angle.  $D$  and  $F$  are the midpoints of  $AB$  and  $AC$ , respectively. What is the value of  $w$ ?

A. 1

B.  $\sqrt{3}$

C. 2

D.  $2\sqrt{3}$

**Answer: B**



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**8.** A toy pyramid (not shown) is made from poly(methyl methacrylate), better known by its trade term Lucite. The toy pyramid has a regular hexagonal base of  $15\text{cm}^2$  and a height of 4 cm. In the base of the pyramid, there is a semispherical indentation 2 cm in diameter. If

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A.  $1.06g / cm^3$

B.  $1.18g / cm^3$

C.  $2.09g / cm^3$

D.  $6.51g / cm^3$

**Answer: B**



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## Examples

1. In  $\triangle ABC$  (not shown),  $\angle ABC = 60^\circ$  and  $AC \perp BC$ . If  $AB = x$ , then what is the area of  $\triangle ABC$ , in terms of  $x$ ?

A.  $\frac{x^2\sqrt{3}}{8}$

B.  $\frac{x^2\sqrt{3}}{4}$

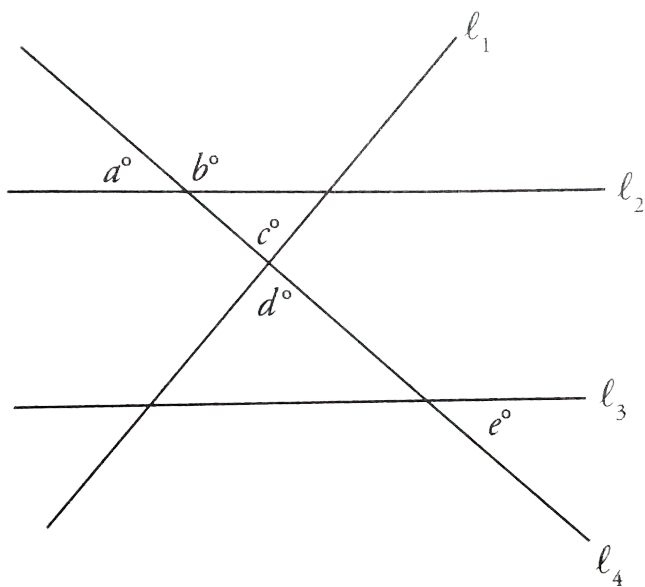
C.  $\frac{x^2\sqrt{3}}{2}$

D.  $x^2\sqrt{3}$

Answer: A



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2.

In the figure above  $l_2 \parallel l_3$ , which of the following could be false?

A.  $a=e$

B.  $b+e=180$

C.  $l_1 \perp l_4$

D.  $c = d$

**Answer: C**



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3.  $\frac{54}{7}\pi$  radians is approximately equal to how many degrees?



A.  $8^\circ$

B.  $694^\circ$

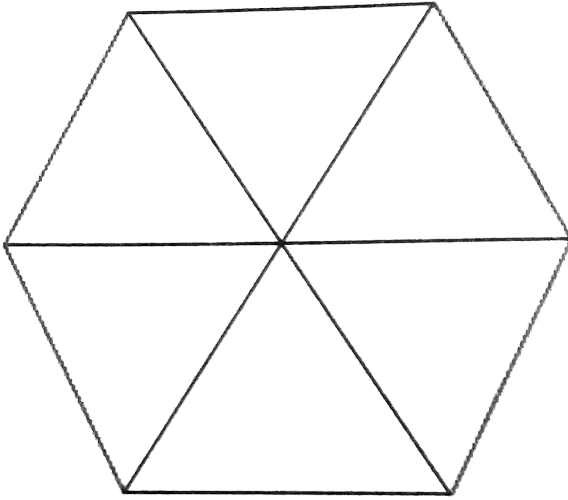
C.  $1,389^\circ$

D.  $2,777^\circ$

**Answer: C**



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4.

The regular hexagon shown above is divided into six congruent equilateral triangles. What is the measure, in degrees, of one of the interior angles of the hexagon?

A.  $60^\circ$

B.  $120^\circ$

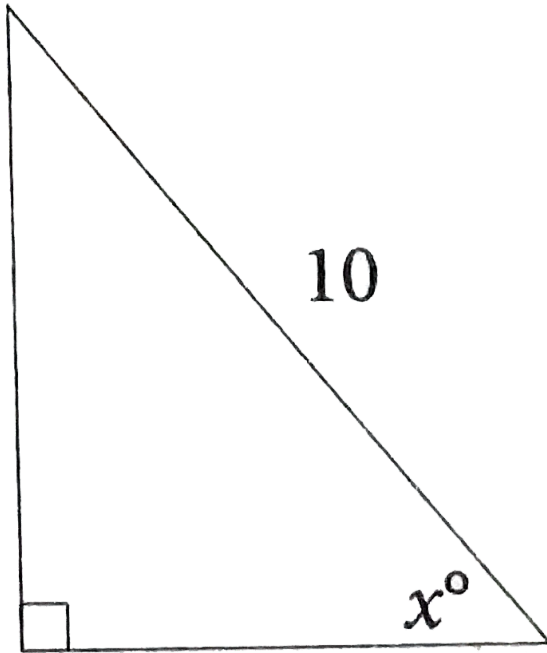
C.  $180^\circ$

D.  $360^\circ$

**Answer: B**



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5.

In the triangle above,  $\sin x = 0.8$  and  $\cos x = 0.6$ .

What is the area of the triangle?

A. 0.48

B. 4.8

C. 24

D. 48

**Answer: C**



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6. In  $\triangle ABC$  (not shown),

$AC \perp BC$  and  $\cos \angle ABC = \frac{12}{13}$ . What is the

value of  $\tan \angle ABC$ ?

A.  $\frac{5}{13}$

B.  $\frac{5}{12}$

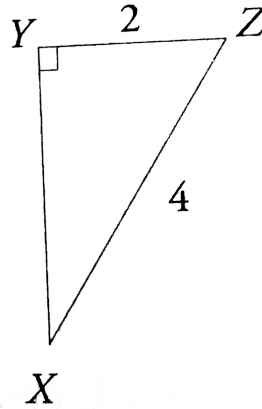
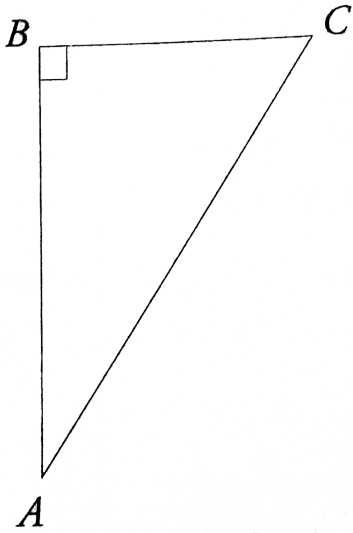
C.  $\frac{12}{13}$

D.  $\frac{12}{5}$

**Answer: B**



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7.

In the figure above,  $\triangle ABC$  is similar to  $\triangle XYZ$ , what is the value of  $\cos A$ ?

A.  $\frac{1}{2}$

B.  $\frac{\sqrt{3}}{2}$

C.  $\sqrt{3}$

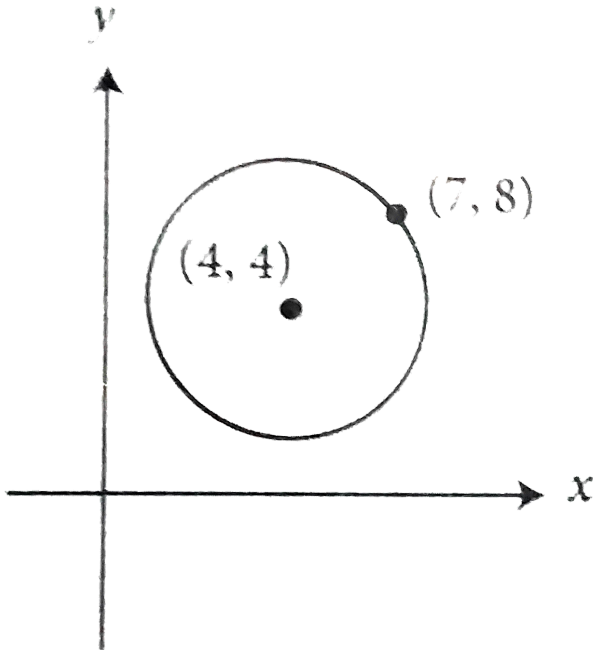
D. 2

**Answer: B**



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8.

the circle defined by the equation  $(x - 4)^2 + (y - 4)^2 = 25$  has its centre at point (4,4) and includes point (7,8) on the circle. This is shown in the figure above. What is the area of the circle shown?

A.  $5\pi$

B.  $10\pi$

C.  $16\pi$

D.  $25\pi$

**Answer: D**



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9. Point A and B lie on circle O (not shown),  $AO=3$  and  $\angle AOB = 120^\circ$ . What is the area of minor sector AOB?

A.  $\frac{\pi}{3}$

B.  $\pi$

C.  $3\pi$

D.  $9\pi$

**Answer: C**



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**10.** If the perimeter of a square is 28, what is the length of the diagonal of the square?

A.  $2\sqrt{14}$

B.  $7\sqrt{2}$

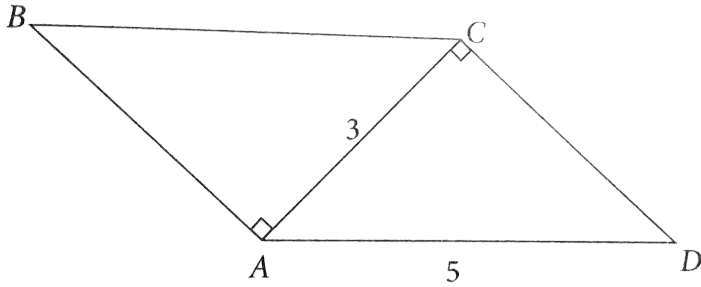
C.  $7\sqrt{3}$

D. 14

**Answer: B**



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Note: Figure not drawn to scale.

11.

In parallelogram ABCD above,  $AC=3$  and  $AD=5$ .

What is the area of ABCD?

A. 12

B. 15

C. 18

D. 20

**Answer: A**



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**12.** A sphere has a volume of  $36\pi$ . What is the surface area of the sphere? (The surface area of a sphere is given by the formula  $A = 4\pi r^2$ )

A.  $3\pi$

B.  $9\pi$

C.  $27\pi$

D.  $36\pi$

**Answer: D**



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**13.** The base of triangle T is 40 percent less than the length of rectangle R. The height of triangle T is 50 percent greater than the width of rectangle R. The area of triangle T is what percent of the area of rectangle R?

A. 10

B. 45

C. 90

D. 110

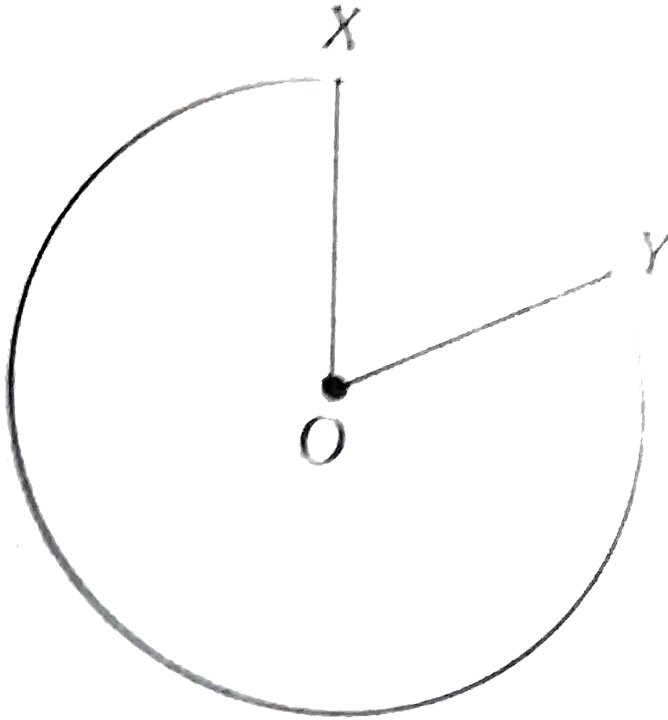
**Answer: B**



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**Geometry Drill 1 No Calculator Section**





1.

In the figure above, circle  $O$  has a radius of 8, and angle  $XOY$  measures  $\frac{5}{16}\pi$  radians. What is the measure of minor arc  $XY$ ?

A.  $\frac{5}{16}\pi$

B.  $\frac{5}{2}\pi$

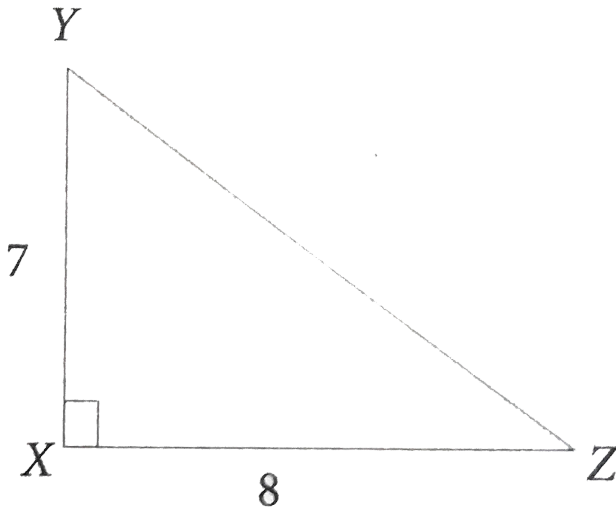
C.  $5\pi$

D.  $16\pi$

**Answer: B**



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2.

What is the value of  $\tan \angle XZY$ ?

A.  $\frac{7\sqrt{115}}{115}$

B.  $\frac{8\sqrt{115}}{115}$

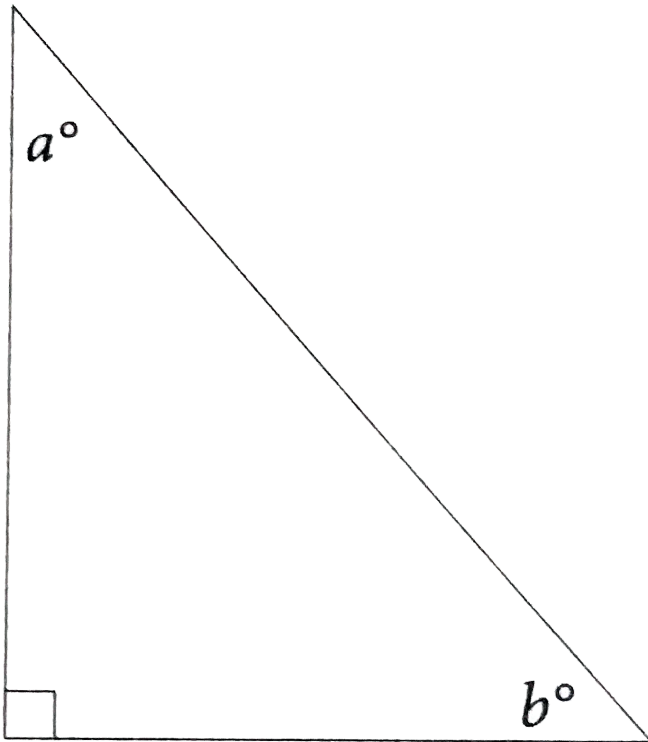
C.  $\frac{7}{8}$

D.  $\frac{8}{7}$

**Answer: C**



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**3.**

In the figure above,  $\sin a = x$  what is the value of

cos b?

A.  $x$

B.  $\frac{1}{x}$

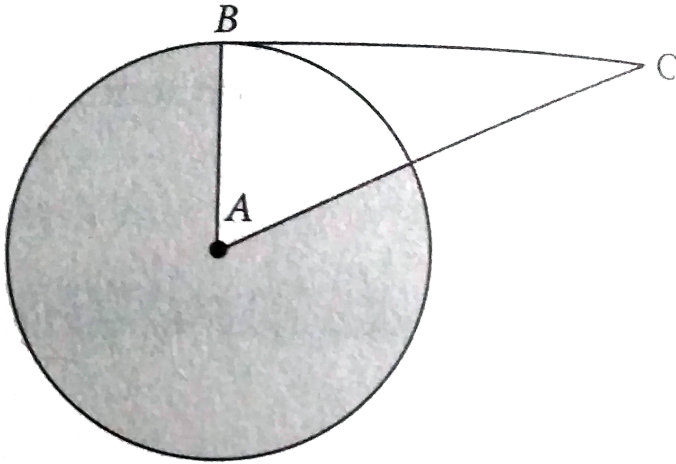
C.  $|1 - x|$

D.  $\frac{90 - x}{90}$

**Answer: A**



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4.

The circle above with centre  $A$  has an area of 21.  $BC$  is tangent to the circle with centre  $A$  at point  $B$ . If  $AC=2AB$ , then what is the area of the shaded region?

A. 3.5

B. 15.75

C. 17.5

D. 21

**Answer: C**



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