

A circle has a circumference of 16π inches. What is the area of the circle, in square inches?

F. 8π

G. 16π

H. 32π

J. 64π

K. 256π

Circumference



Area



$2\pi r$

$$2\pi \times \text{Radius} = 16\pi$$

$$\frac{2 \times \text{Radius}}{2} = \frac{16}{2}$$

Radius = 8

πr^2

$$\begin{aligned} \text{Area} &= \pi \times \text{Radius}^2 \\ &= \pi \times 8^2 \\ &= \pi \times 64 \end{aligned}$$

3. A right circular cylinder has a base radius of 3 inches and a height of 8 inches. What is the total surface area, in square inches, of the cylinder including its two circular bases?

~~A. 48π~~

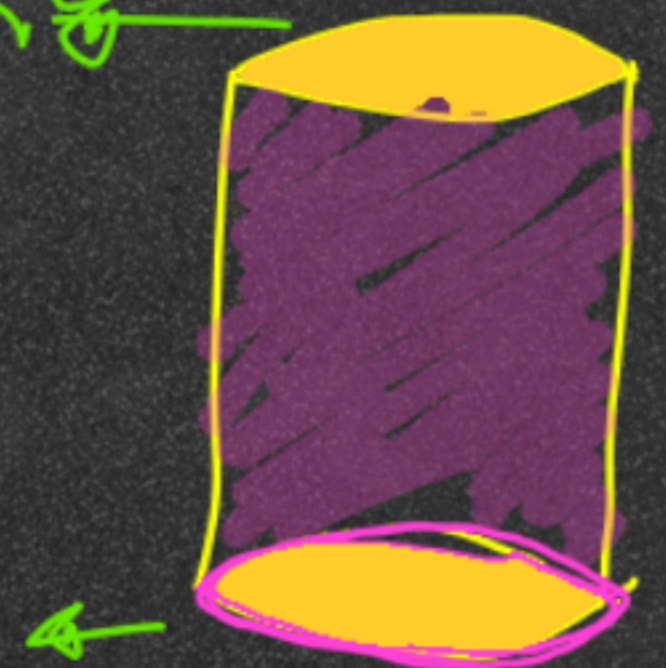
B. 51π

C. 66π

D. 72π

E. 96π

$$\begin{aligned} \text{Area} &= (\text{Base} \times \text{height}) + \pi r^2 + \pi r^2 \\ &= 2\pi r \times \text{height} + 2\pi r^2 \\ &= \underline{2\pi(3)} \times 8 + 2\pi(3)^2 \\ &= 6\pi \times 8 + 2\pi(9) \\ &= 48\pi + 18\pi \\ &= \underline{66\pi} \end{aligned}$$



Base height
~~length~~

4. In $\triangle ABC$, the base BC measures 14 centimeters and the corresponding height is 9 centimeters. If a square has the exact same area as $\triangle ABC$, what is the length of one side of the square, in centimeters?

F. $3\sqrt{7}$

G. $3\sqrt{14}$

H. 63

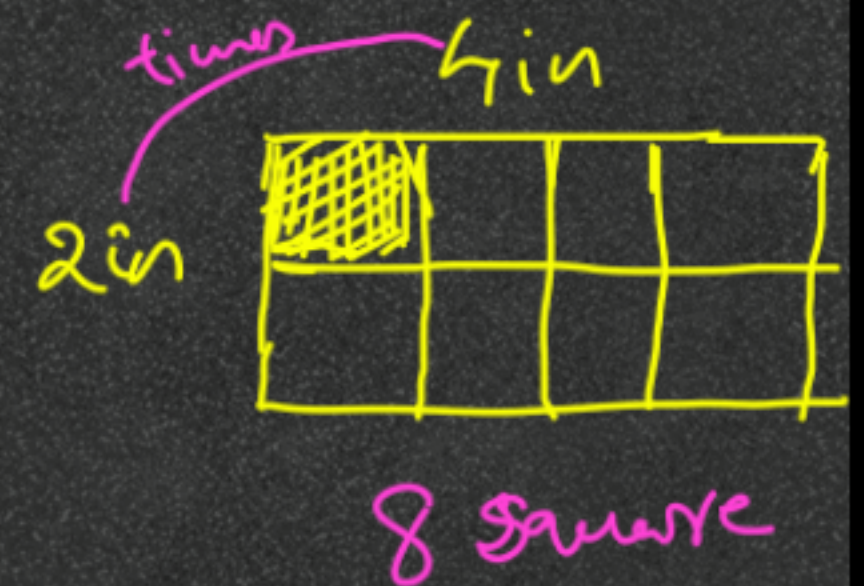
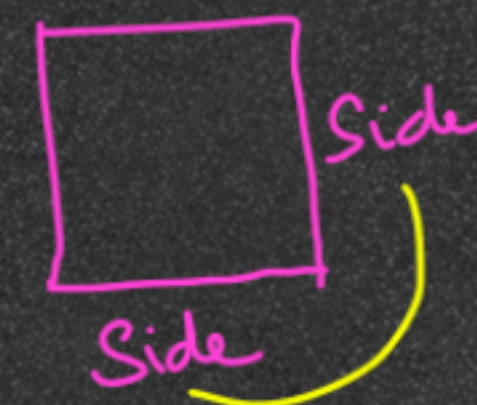
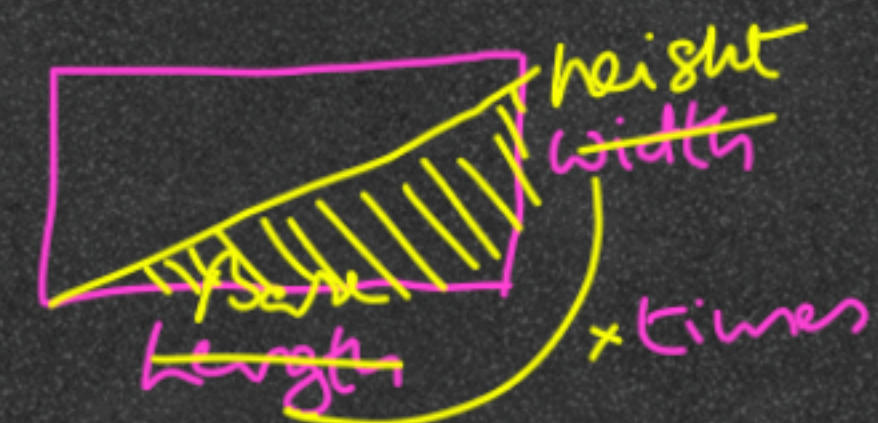
J. 126

K. $9\sqrt{14}$

$$\begin{aligned} \text{Area of square} &= \text{Area of triangle} \\ \text{Side}^2 &= \frac{1}{2} \times \text{base} \times \text{height} \\ &= \frac{1}{2} \times 14 \times 9 \end{aligned}$$

$$\begin{aligned} \text{Side}^2 &= 63 \\ \text{Side} &= \sqrt{63} \\ \text{Side} &= \sqrt{9 \times 7} \\ &= 3\sqrt{7} \end{aligned}$$

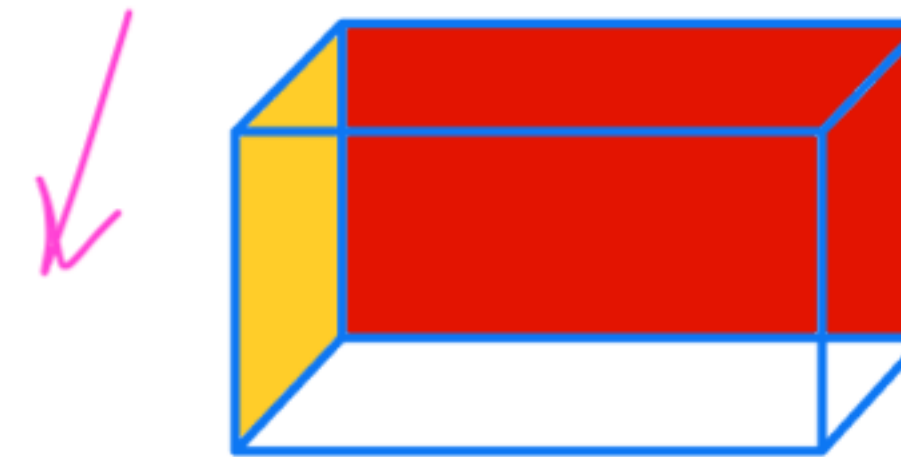
$$\text{Area} = \frac{\text{Base} \times \text{height}}{2}$$



5. A rectangular prism has a volume of 240 cubic feet. If its length is 8 feet and its width is 5 feet, what is the total surface area, in square feet, of the prism?

- A. 60
- B. 118
- C. 236
- D. 240
- E. 480

$$\begin{aligned} \text{Vol} &= l \times w \times h \\ 240 &= 8 \times 5 \times h \\ \cancel{240} &= \cancel{40} \times h \\ \underline{6} &= h \end{aligned}$$



$$\begin{aligned} \text{Total Surface area} &= 2lw + 2wh + 2lh \\ &= 2(\underline{8})(\underline{5}) + 2(\underline{5})(\underline{6}) + 2(\underline{8})(\underline{6}) \\ &= 80 + 60 + 96 \\ &= 236 \end{aligned}$$

$$\begin{aligned} &16 \times 6 \\ &[16 \times 6] \times 6 \end{aligned}$$

$$\begin{aligned} &\cancel{24 \times 10} \\ &\cancel{4 \times 10} \end{aligned}$$

6. A trapezoid has parallel bases measuring 10 meters and 16 meters. If its height is 7 meters, what is the area of the trapezoid, in square meters?

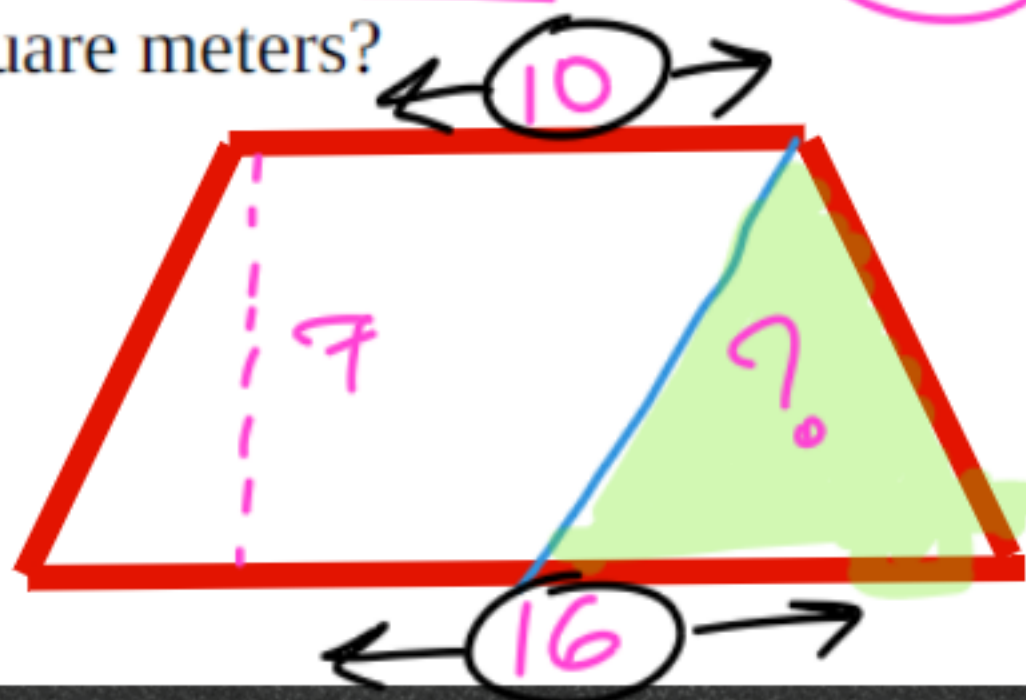
F. 91

G. 112

H. 130

J. 182

K. 224



$$\begin{aligned}\text{Area of trapezoid} &= \frac{1}{2} \times (b_1 + b_2) \times h \\ &= \frac{1}{2} \times (10 + 16) \times 7 \\ &= \frac{1}{2} \times 26 \times 7 \\ &= \underline{\underline{91}}\end{aligned}$$

$$\begin{aligned}&13 \times 7 \\ &(10 + 3) \times 7\end{aligned}$$

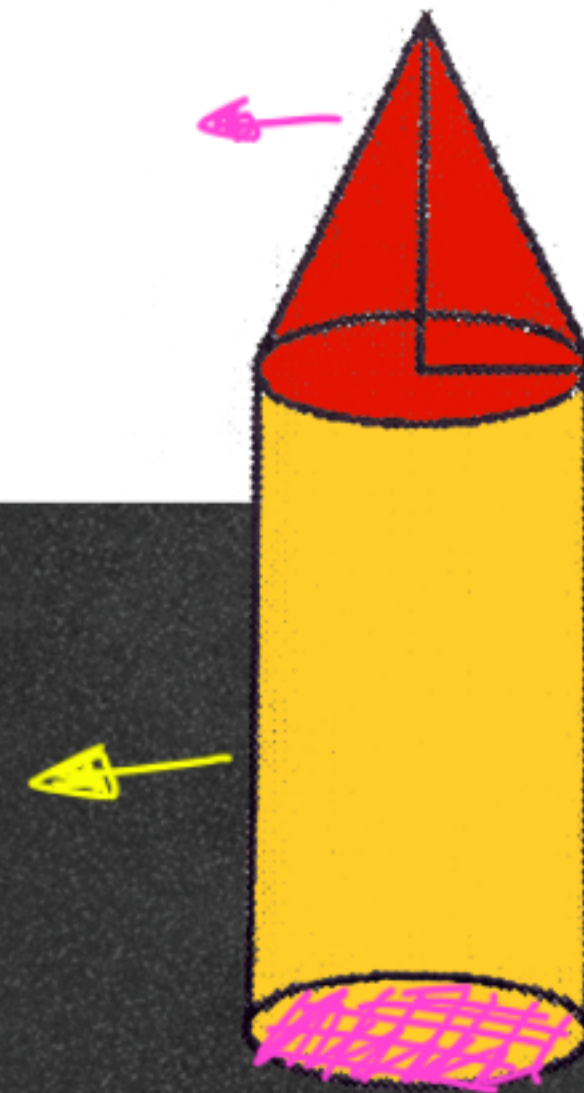
7. A composite figure is constructed by mounting a solid right circular cone on top of a solid cylinder such that their circular bases coincide perfectly. The cylinder has a base radius of 5 cm and a height of 10 cm. The cone has a height of 12 cm. What is the total volume, in cubic centimeters, of the combined solid?

- A. 150π
- B. 250π
- C. 350π
- D. 400π
- E. 550π

$$\begin{aligned} \text{Vol} &= \frac{1}{3} \pi r^2 h \\ &= \frac{1}{3} \pi (5)^2 (12) \end{aligned}$$

$$100\pi$$

$$\begin{aligned} \text{Vol} &= \pi \times \text{Radius}^2 \times \text{hei} \\ &= \pi (5)^2 (10) \\ &= 250\pi \end{aligned}$$



Area
~~length~~ $\times h$
 $\pi r^2 h$

Area

$\times \pi$

8. A right isosceles triangle has a hypotenuse of length $12\sqrt{2}$ units. What is the perimeter of this triangle, in units?

F. 24

G. $12 + 12\sqrt{2}$

H. $24 + 12\sqrt{2}$

J. $24\sqrt{2}$

K. $36\sqrt{2}$

12. A solid metal cube with an edge length of 6 inches is melted down and recast into a rectangular prism with a square base of side length 3 inches. What is the height, in inches, of the new prism?

F. 12

G. 18

H. 24

J. 36

K. 72

13. The floor of a storage shed is a regular hexagon inscribed inside a circular boundary of radius 8 feet. What is the perimeter, in feet, of the hexagonal floor?

- A. 24
- B. 48
- C. $24\sqrt{3}$
- D. $48\sqrt{3}$
- E. 96

