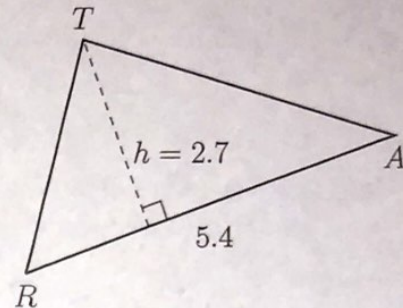


8.1 Circle area and circumference

1. Find the area of $\triangle RAT$. The altitude h of the triangle is 2.7 centimeters and the base $RA = 5.4$ cm. Show work by writing an equation before making the calculation.

$$A = \frac{1}{2} (2.7)(5.4)$$

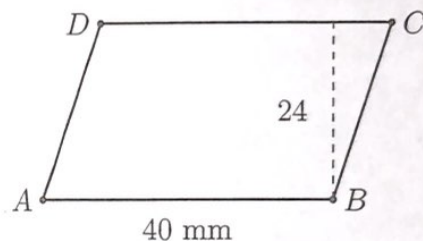
$$= 7.29 \text{ cm}^2$$



2. Find the area of the parallelogram $ABCD$ shown below, with $AB = 40$ millimeters and height $h = 24$ mm.

$$A = 40 \times 24$$

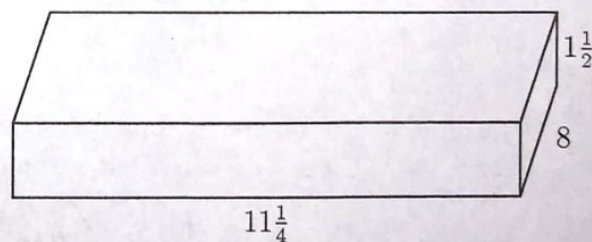
$$= 960 \text{ mm}^2$$



3. A wooden cutting board is $11\frac{1}{4}$ inches long, 8 inches wide, and $1\frac{1}{2}$ inches thick. Find the volume of wood in cubic inches. (diagram not to scale)

$$V = (11\frac{1}{4})(8)(1\frac{1}{2})$$

$$= 135 \text{ in}^3$$



Model the situation with an equation. Use the formula sheet on the last page. You must start with a labeling variable. Do NOT solve!

4. *Worked example:* Find the radius of a circle circumference of 14.7.

$$C = 2\pi r = 14.7$$

5. A prism has a base area of 20 square centimeters. Its volume is 200 cubic centimeters. Find the prism's height, h .

$$V = 20h = 200$$

6. A water tank in the shape of a cylinder has a volume of 250 cubic feet. Its height is 12 feet. Find the radius of the base of the tank.

$$V = \pi r^2 (12) = 250$$

7. A spherical cork fishing net float has a volume of 4000 cubic centimeters. Find its radius.

$$V = \frac{4}{3} \pi r^3 = 4000$$

8. The volume of a cone having a diameter of 10 inches is 200 cubic inches. Find the cone's height.

$$V = \frac{1}{3} \pi \left(\frac{10}{2}\right)^2 h = 200$$

9. The volume of the Great Pyramid of Giza, the tomb of Pharaoh Khufu, is approximately 2,500,000 cubic meters. It is 140 meters tall. Find the area of its base.

$$V = \frac{1}{3} B (140) = 2,500,000$$

10. The smaller pyramid for his wife, Queen Meretites, has a square base with an area of 2500 square meters. Find the length of the side of its base, s .

$$\cancel{A = 2500} \quad A = s^2 = 2500$$

Name:

11. In your notebook, write the formulas for the area and circumference of circles:

$$A = \pi r^2$$

$$C = \pi D = 2\pi r$$

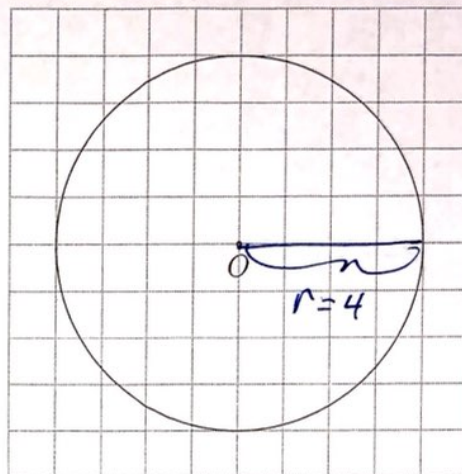
12. Given the circle centered at O with radius $r = 4$.

- (a) Find the circumference of a circle.

$$\begin{aligned} C &= 2\pi 4 = 8\pi \\ &= 25.1327... \approx 25.1 \end{aligned}$$

- (b) Find the area of the circle.

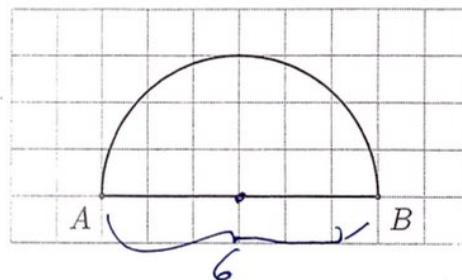
$$\begin{aligned} A &= \pi 4^2 = 16\pi \\ &= 50.26548245743669... \\ &\approx \underline{\underline{50.3}} \end{aligned}$$



13. Given the semi-circle shown with diameter $AB = 6$. Find its area and perimeter.

$$\begin{aligned} A_{sc} &= \frac{1}{2} \pi \left(\frac{6}{2}\right)^2 = 4\frac{1}{2}\pi \\ &= 14.13716549145834... \approx 14.1 \end{aligned}$$

$$\begin{aligned} P &= \frac{1}{2} \pi (6) + 6 \\ &= 3\pi + 6 = 15.42477796076938... \\ &\approx 15.4 \end{aligned}$$



14. Find the radius of a circle having an area of 25π .

$$\begin{aligned} A &= \pi r^2 = 25\pi \\ r &= 5 \end{aligned}$$

15. Find the diameter of a circle with a circumference of 31.416.

$$\begin{aligned} C &= \pi D = 31.416 \\ D &\approx 10.0 \end{aligned}$$

Equation-of-a-circle algebra competencies

16. Expand each binomial-squared expression to the form $ax^2 + bx + c$.

(a) $(x+3)(x+3)$

$$= x^2 + 6x + 9$$

(c) $(x+5)^2$

$$= x^2 + 10x + 25$$

(b) $(x+2)^2$

$$= x^2 + 4x + 4$$

(d) $(x+7)^2$

$$= x^2 + 14x + 49$$

17. Simplify each radical.

(a) $\sqrt{50}$

$$= \sqrt{25} \sqrt{2}$$

$$= 5\sqrt{2}$$

(c) $\sqrt{27}$

$$= \sqrt{9} \sqrt{3}$$

$$= 3\sqrt{3}$$

(b) $\sqrt{18}$

$$= \sqrt{9} \sqrt{2}$$

$$= 3\sqrt{2}$$

(d) $\sqrt{24}$

$$= \sqrt{4} \sqrt{6}$$

$$= 2\sqrt{6}$$

18. Solve for the appropriate variable (h and r).

(a) $\text{Area} = \frac{1}{2}(14.8)h = 62.9$

$$h = 8.5$$

(b) $\text{Area} = \pi r^2 = 483$

$$r = 12.3993 \dots$$

$$\approx 12.4$$