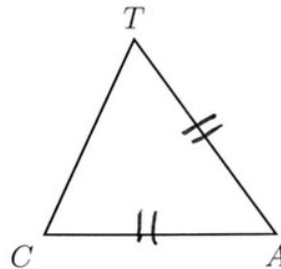


1.11 Pretest review: Length and area

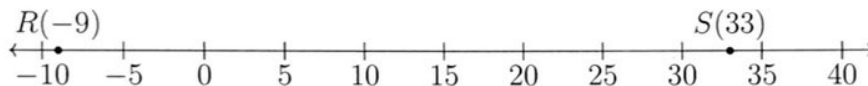
Show units if given. Show calculation as an equation, starting with a capitalized variable.

Line segments, length, number lines

1. Given isosceles $\triangle CAT$ with $\overline{CA} \cong \overline{AT}$. On the diagram mark the congruent line segments with tick marks.

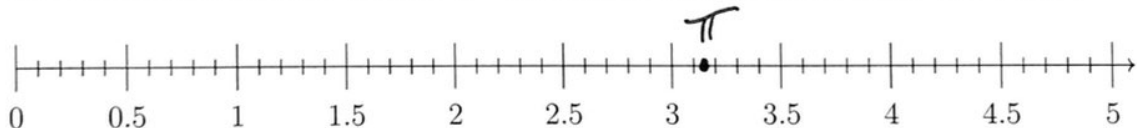


2. Points $R = -9$ and $S = 33$ are shown below. Find RS .



$$RS = 33 - (-9) = 42$$

3. Mark and label irrational number $\pi = 3.14159265358\dots$ on the number line below.

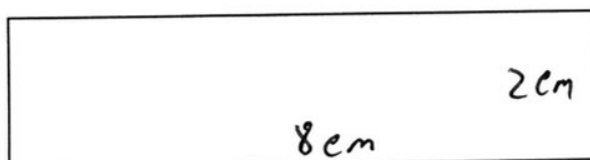


4. Given \overline{DEF} , $DE = 5\frac{3}{4}$, and $EF = 8\frac{1}{2}$. Find DF as a mixed fraction.



$$\begin{aligned} DF &= 5\frac{3}{4} + 8\frac{1}{2} \\ &= 14\frac{1}{4} \end{aligned}$$

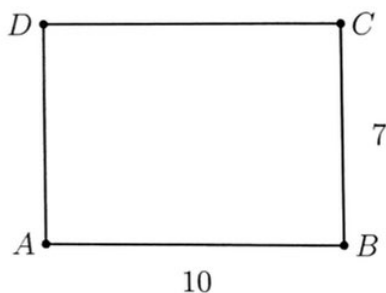
5. Measure and mark the lengths of the sides of the rectangle in centimeters. Find its perimeter.



$$\begin{aligned} P &= 2(8) + 2(2) \\ &= 20 \text{ cm} \end{aligned}$$

Perimeter and area

6. The rectangle $ABCD$ with dimensions $AB = 10$ inches, $BC = 7$ in.



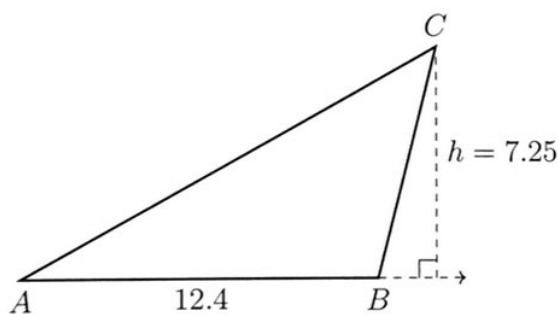
- (a) Find the area of the rectangle.

$$A = 10 \cdot 7 = 70 \text{ in}^2$$

- (b) Find its perimeter.

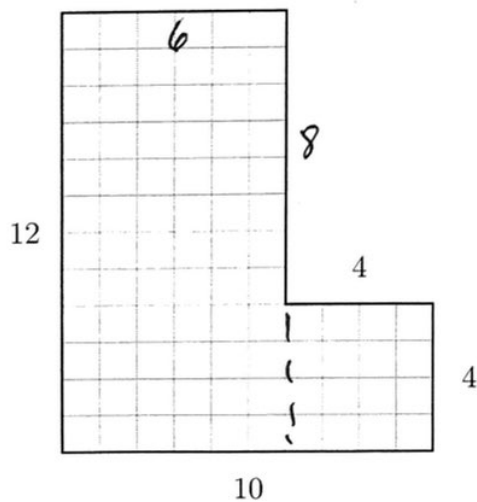
$$P = 2(10) + 2(7) = 34 \text{ in}$$

7. The side \overline{AB} of triangle ABC is extended and an altitude to the vertex C is drawn, as shown below. The triangle's height is $h = 7.25$ and its base measures $AB = 12.4$. Find the area of the triangle.



$$A = \frac{1}{2} (12.4)(7.25) \\ = 44.95$$

8. Find the area of the compound rectangular shape. Use area formulas for full credit.



$$A = 12 \cdot 6 + 4 \cdot 4 \\ = 88$$

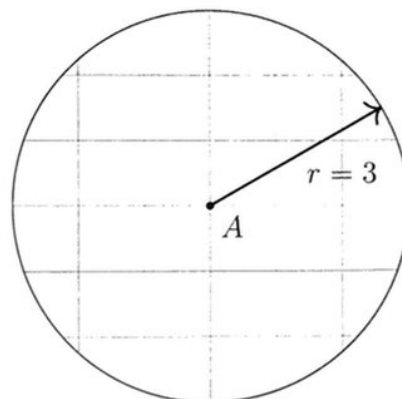
9. Given the circle A with radius $r = 3$. Leave exact answers, in terms of π .

(a) Find the circumference of circle A .

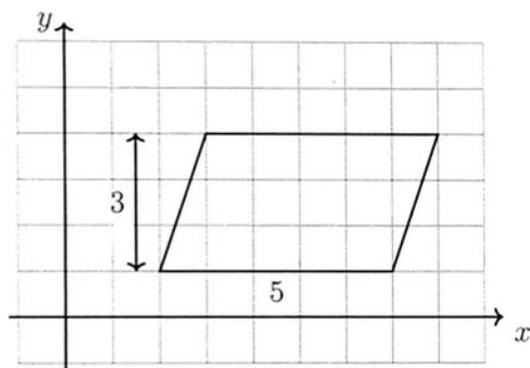
$$C = 2\pi r = 6\pi$$

(b) Find the area of the circle.

$$A = \pi r^2 = 9\pi$$

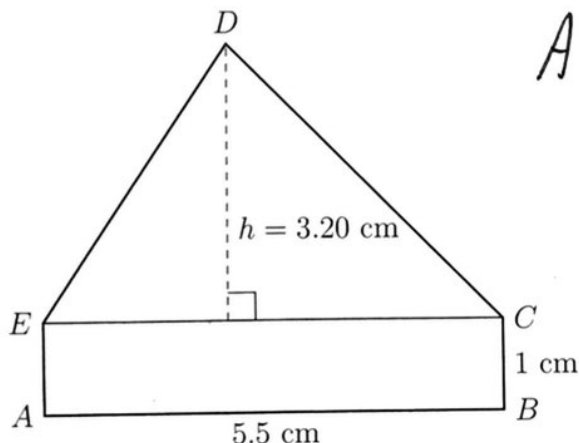


10. Find the area of the parallelogram shown with a base $b = 5$ and height $h = 3$.



$$A = 3 \times 5 = 15$$

11. Find the area of shape $ABCDE$ below, a triangle on a rectangle. The altitude h of the triangle is 3.20 centimeters and the base $EC = 5.5$ cm. The rectangle is 1 cm tall. (diagram not to scale)



$$\begin{aligned} A &= 5.5 \times 1 + \frac{1}{2}(5.5)(3.20) \\ &= 5.5 + 8.8 \\ &= 14.3 \text{ cm}^2 \end{aligned}$$

Precision, percent error

12. Round each value to the nearest hundredth.

$$(a) \frac{2}{3} = 0.6666... \approx 0.67$$

$$(b) \sqrt{5} = 2.236067... \approx 2.24$$

13. Round each value to the nearest thousand.

$$(a) 7,917.5 \text{ miles} \approx 8,000 \text{ miles} \quad (b) 2,159.1 \text{ miles} \approx 2,000 \text{ mi.}$$

(diameter of the earth) (diameter of the moon)

14. Convert each measure, showing the conversion factor and units.

(a) Find the length in miles of a 10K race (10 kilometers).

$$10 \text{ km} \times \frac{0.62 \text{ miles}}{1 \text{ km}} = 6.2 \text{ miles}$$

(b) Find the height in inches of a person 1.8 meters tall.

$$1.8 \text{ m} \times \frac{39.37 \text{ in}}{1 \text{ m}} = 70.866 \text{ inches}$$

15. Find the number of minutes in a day.

$$1 \text{ day} \times \frac{24 \text{ hours}}{1 \text{ day}} \times \frac{60 \text{ minutes}}{1 \text{ hour}} = 1440 \text{ minutes}$$

16. Find the percent error for each approximation.

(a) $7.753 \approx 8$ billion

(population of the world)

$$\begin{aligned} E &= \left| \frac{8 - 7.753}{7.753} \right| \times 100\% \\ &= 3.18586... \% \\ &\approx 3.19 \% \end{aligned}$$

(b) $4.571 \approx 4\frac{1}{2}$ billion years

(age of the solar system, NASA)

$$\begin{aligned} E &= \left| \frac{4\frac{1}{2} - 4.571}{4.571} \right| \times 100\% \\ &= 1.55327... \% \\ &\approx 1.55 \% \end{aligned}$$

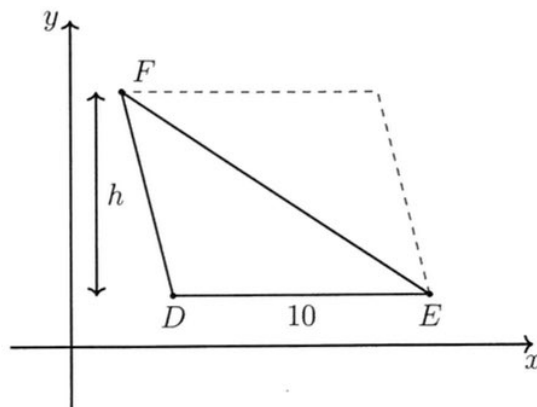
Modeling situations and solving with algebra

17. The $\triangle DEF$ has an area $A = 30$ and base $DE = 10$. Find its height h .

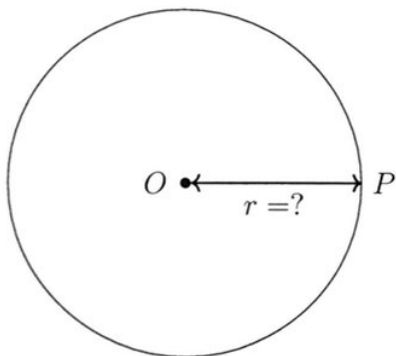
Start with $A = \frac{1}{2}bh = 30$

$$A = \frac{1}{2} 10h = 30$$

$$h = 6$$



18. Given circle O with area $A = 121\pi$ square centimeters. Find the radius, OP .



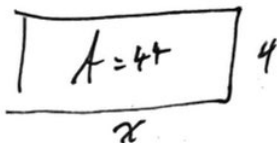
Start with the formula

$$A = \pi r^2 = 121\pi$$

$$r^2 = 121$$

$$r = 11 \text{ cm}$$

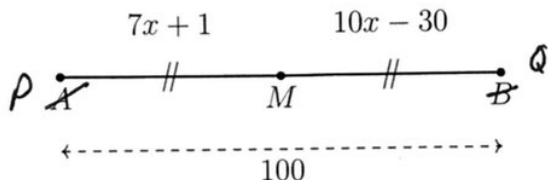
19. A rectangle has an area of 44 square inches. Its width is 4 inches. Find its length.



$$A = 4x = 44$$

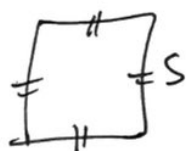
$$x = 11 \text{ inches}$$

20. Given that point M bisects \overline{PQ} , $PM = 7x + 1$, $MQ = 10x - 30$, $PQ = 100$. Circle True or False for each equation.



- (a) T F $7x + 1 = 100$
 (b) T F $7x + 1 = 10x - 30$
 (c) T F $(7x + 1) + (10x - 30) = 100$
 (d) T F $2(10x - 30) = 100$

21. The perimeter of a square classroom is approximately 80 feet. Find its area.



$$P = 4S = 80$$

$$S = 20$$

$$A = 20^2$$

$$= 400 \text{ sq. ft.}$$

22. Below an octagon is inscribed in a circle, the Archimedes used to approximate π . The area of the octagon is $A_{\text{octagon}} \approx 2.8284$.

- (a) Find the area of the circle with $r = 1$.

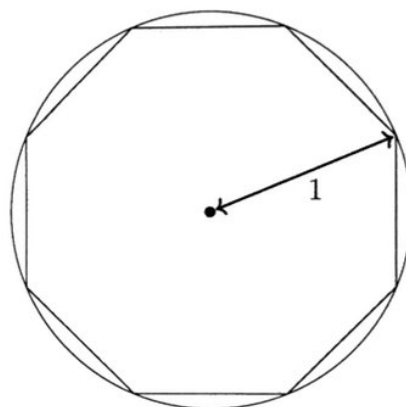
$$A = \pi 1^2 = \pi$$

- (b) Find the percent error of Archimede's approximation using a octagon.

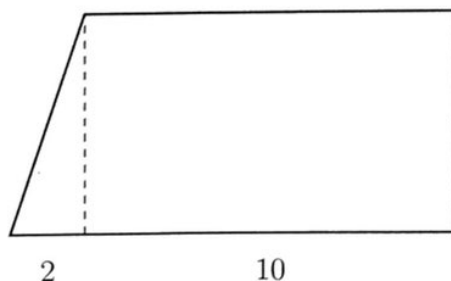
$$\varepsilon = \left| \frac{2.8284 - \pi}{\pi} \right| \times 100\%$$

$$= 9.9692... \%$$

$$\approx 9.97 \%$$



23. The total area of the figure shown is $A = 55$ square centimeters. The triangle with a base of 2 cm is adjacent to a rectangle with a 10 cm base. Find the height.



$h = ?$

$$A = \frac{1}{2}(2)x + 10x = 55$$

$$x + 10x = 55$$

$$11x = 55$$

$$x = 5 \text{ cm}$$