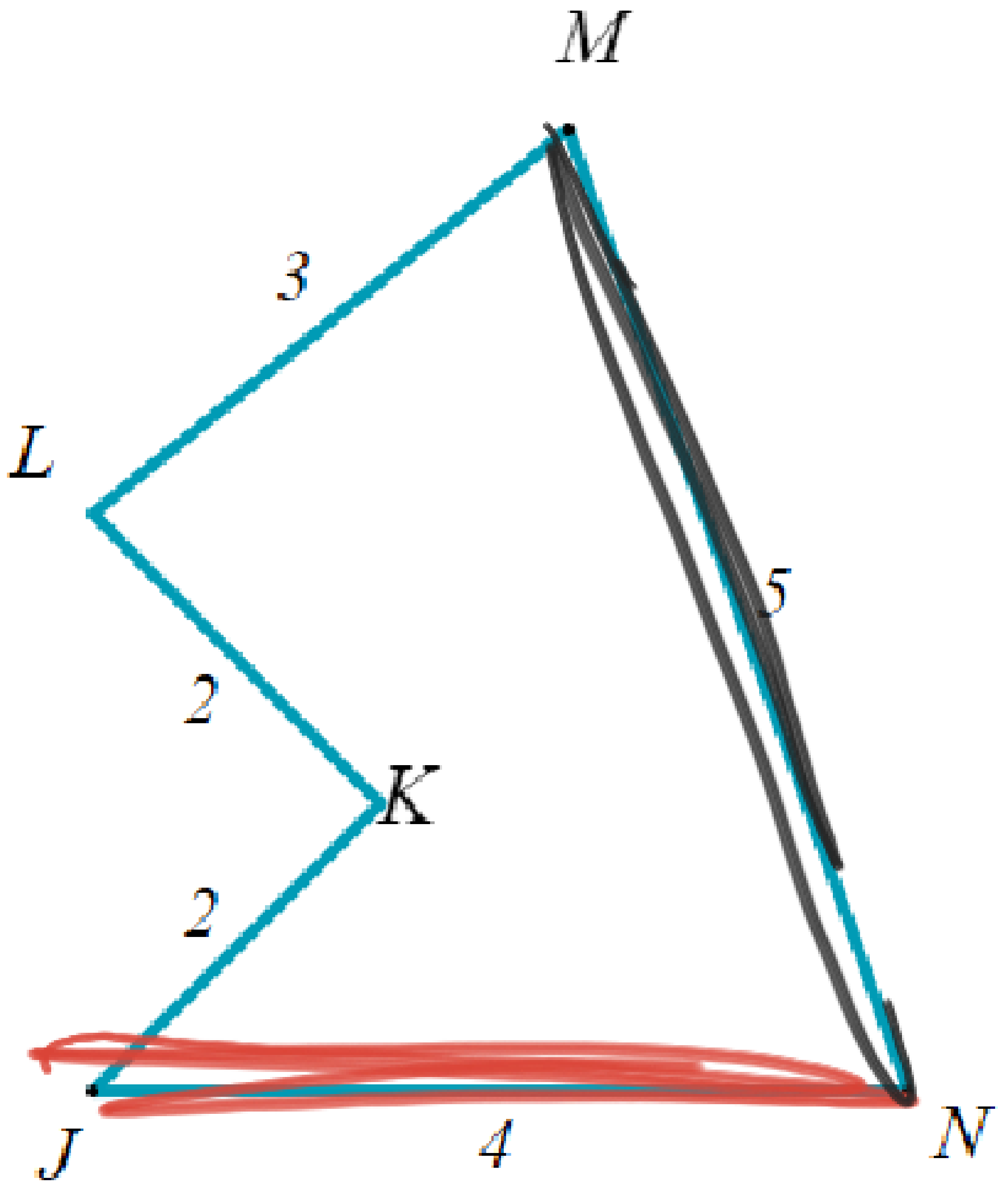
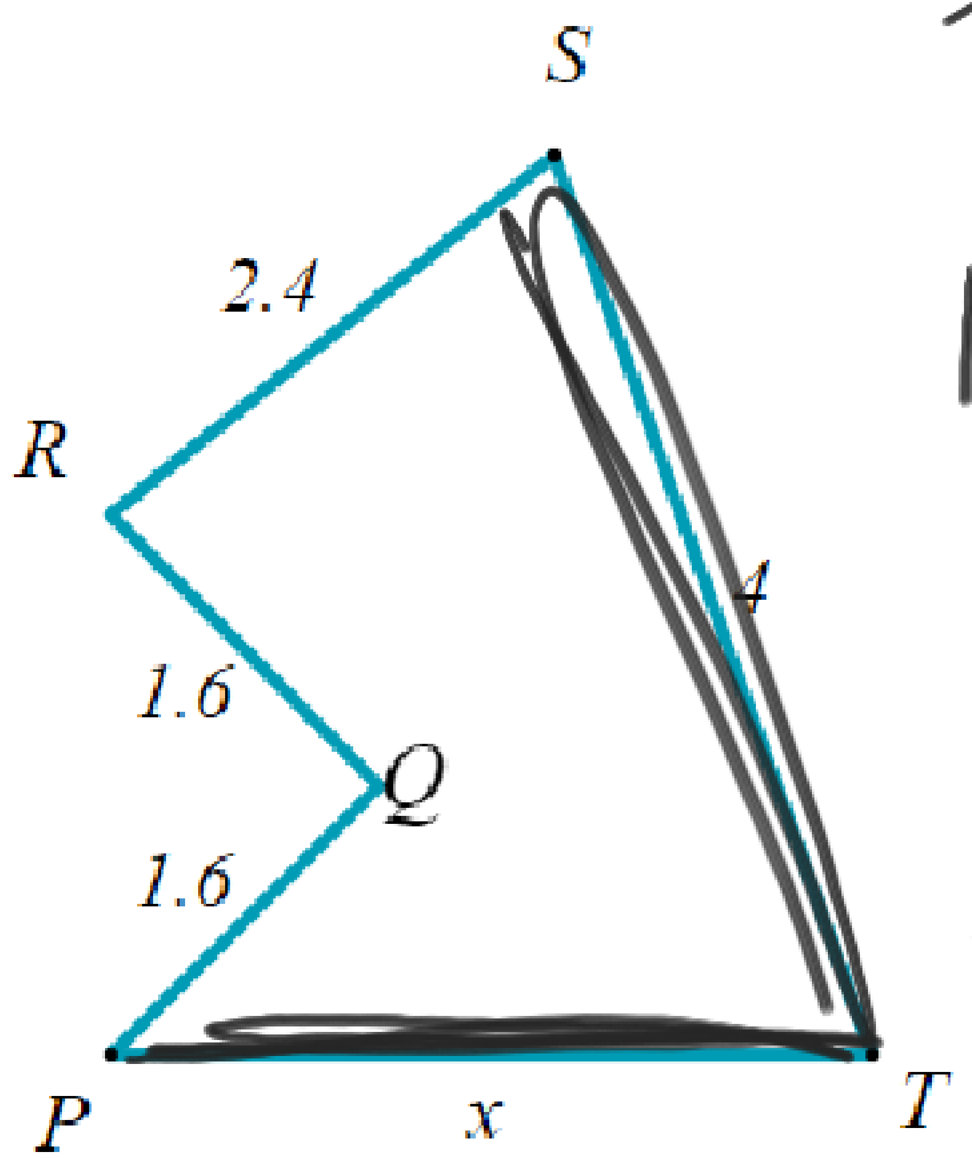
The pentagons $JKLMN$ and $PQRST$ are similar.

Find the length x of $\overline{TP}$.

$\sim$



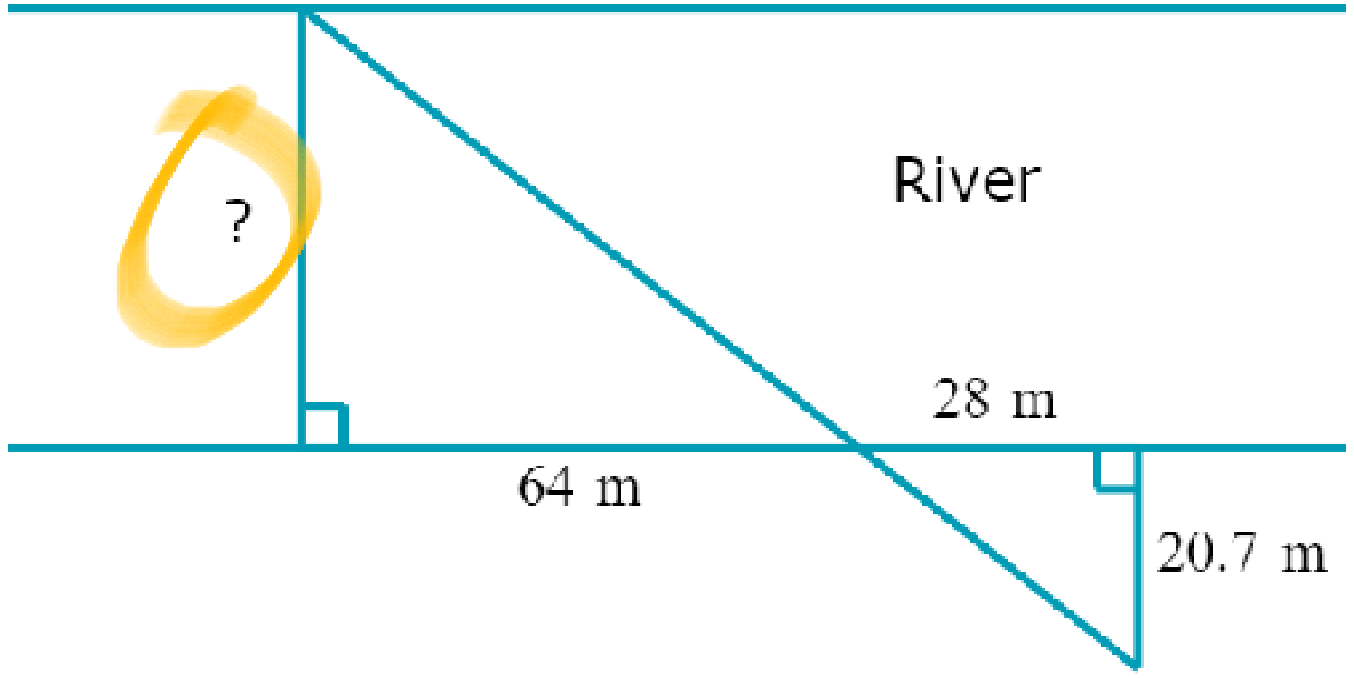


$$\frac{4}{5} = \frac{x}{4}$$

$$\frac{16}{5} = \frac{5x}{5}$$

$$3.2 = x$$

Deandre wants to measure the width of a river. He marks off two right triangles, as shown in the figure. The base of the larger triangle has a length of 64 m, and the base of the smaller triangle has a length of 28 m. The height of the smaller triangle is 20.7 m. How wide is the river? Round your answer to the nearest meter. (The figure is not drawn to scale.)



m

$$\frac{64}{28} = \frac{x}{20.7}$$

$$28x = 1324.8$$

$$x = 47$$

Convert $7°51'\,\cancel{23}''$ to a decimal number of degrees.

60

$\frac{23}{60} = .383$

$\frac{51.383}{60} = 0.856$

$7.856°$

Convert $12.725°$ to degree-minute-second form.

$.725 \times 60$

$12° \; 43' \; 30''$

$.5 \times 60$

(a) Convert 510° to radian measure in terms of π.

☐ radians

(b) Convert $-\frac{5\pi}{2}$ radians to degree measure.

☐ $^\circ$

(a) Convert -173.5° to radian measure.

☐ radians

(b) Convert -192° to radian measure.

☐ radians

$$\frac{510}{360} = \frac{x}{2\pi} \rightarrow \frac{1020\pi}{360} = \frac{360x}{360}$$

$$\frac{17}{6}\pi = x$$

(a) Convert $510°$ to radian measure in terms of π.

☐ radians

(b) Convert $-\dfrac{5\pi}{2}$ radians to degree measure.

☐$°$

(a) Convert $-173.5°$ to radian measure.

☐ radians

(b) Convert $-192°$ to radian measure.

☐ radians

$$\frac{-\frac{5\pi}{2}}{2\pi} = \frac{x}{360} \rightarrow -900\pi = 2\pi x$$

$$-450 = x$$

(a) Convert $-173.5°$ to radian measure.

☐ radians

(b) Convert $-192°$ to radian measure.

☐ radians

$$\frac{-173.5}{360} = \frac{x}{2\pi}$$

$$x = \frac{-173.5(2\pi)}{360} = 3.03$$

$$-\frac{4\pi}{3} \rightarrow -\pi - \frac{\pi}{3}$$

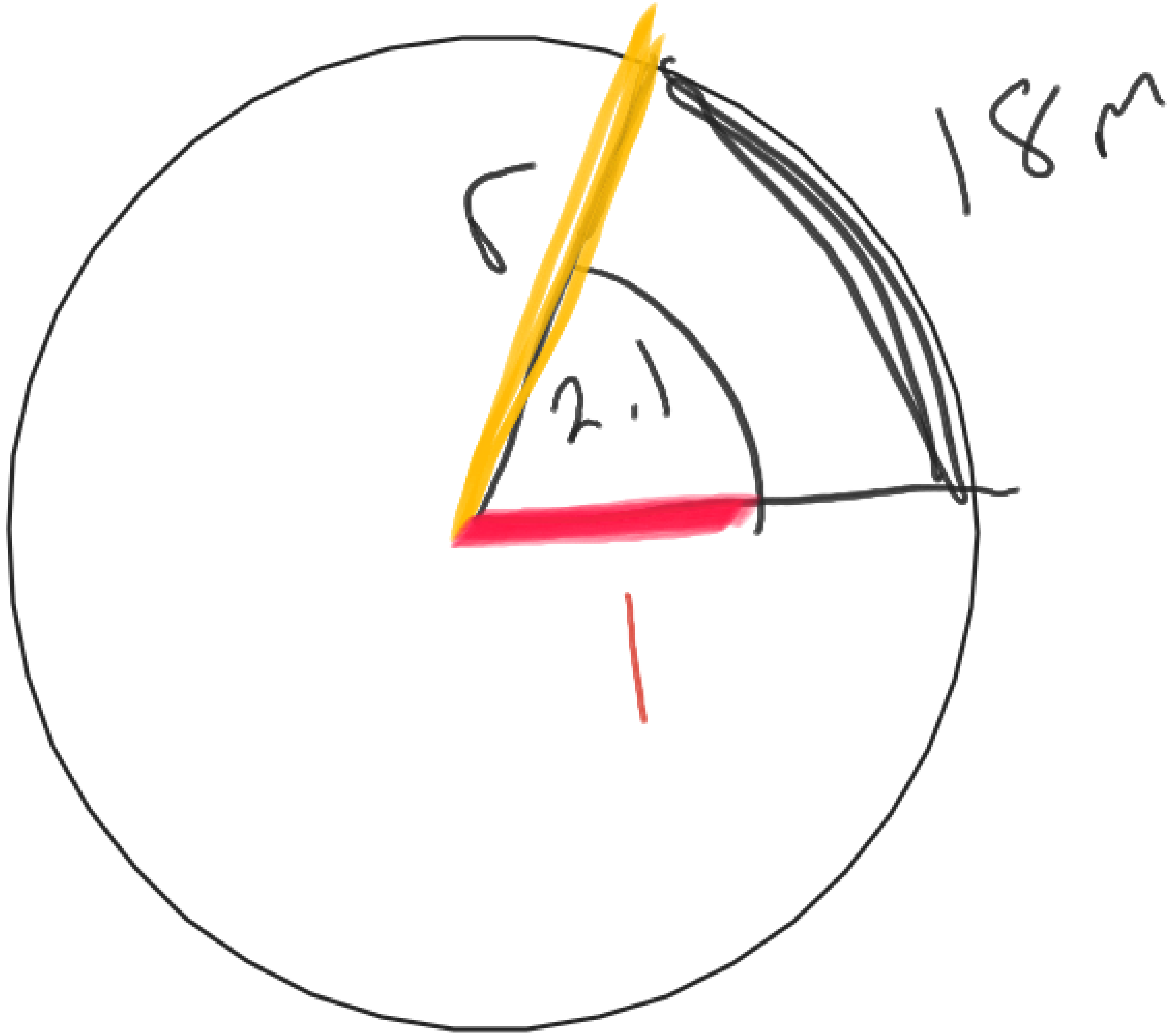
(a) Find an angle between 0 and 2π that is coterminal with $\frac{29\pi}{12}$.

(b) Find an angle between $0°$ and $360°$ that is coterminal with $845°$.

$$\frac{29\pi}{12} - 2\pi = \frac{29}{12}\pi - \frac{24\pi}{12} = \frac{5\pi}{12}$$

$$845 - 360 = 485 - 360 = 125$$

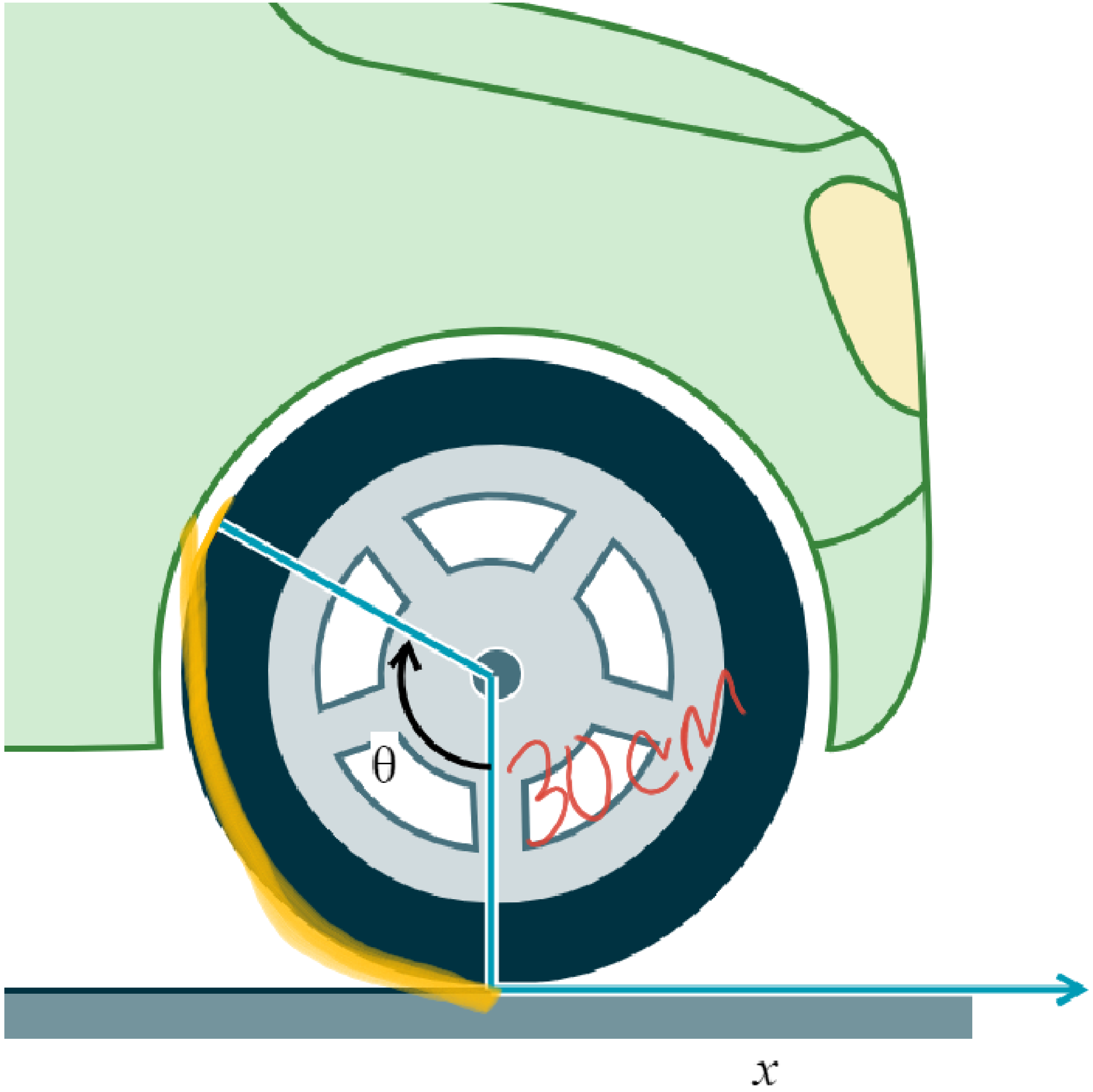
A circular arc has measure 18 m and is intercepted by a central angle of 2.1 radians. Find the radius r of the circle.



$$\frac{2.1}{1} = \frac{18}{r}$$

$$2.1r = 18$$

$$r = 8.57$$

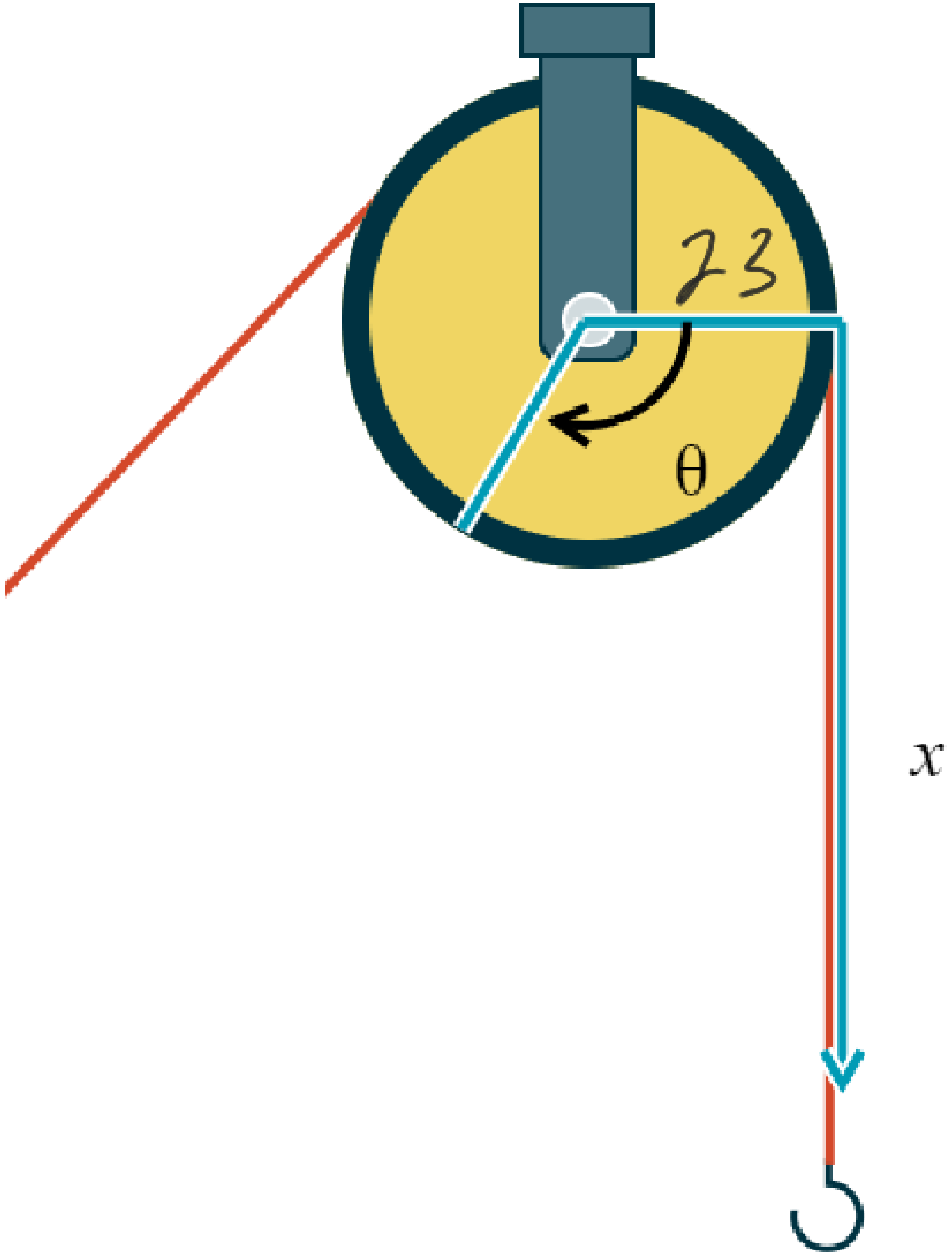


$$\frac{\theta}{1} = \frac{x}{30}$$

$$30\theta = x$$

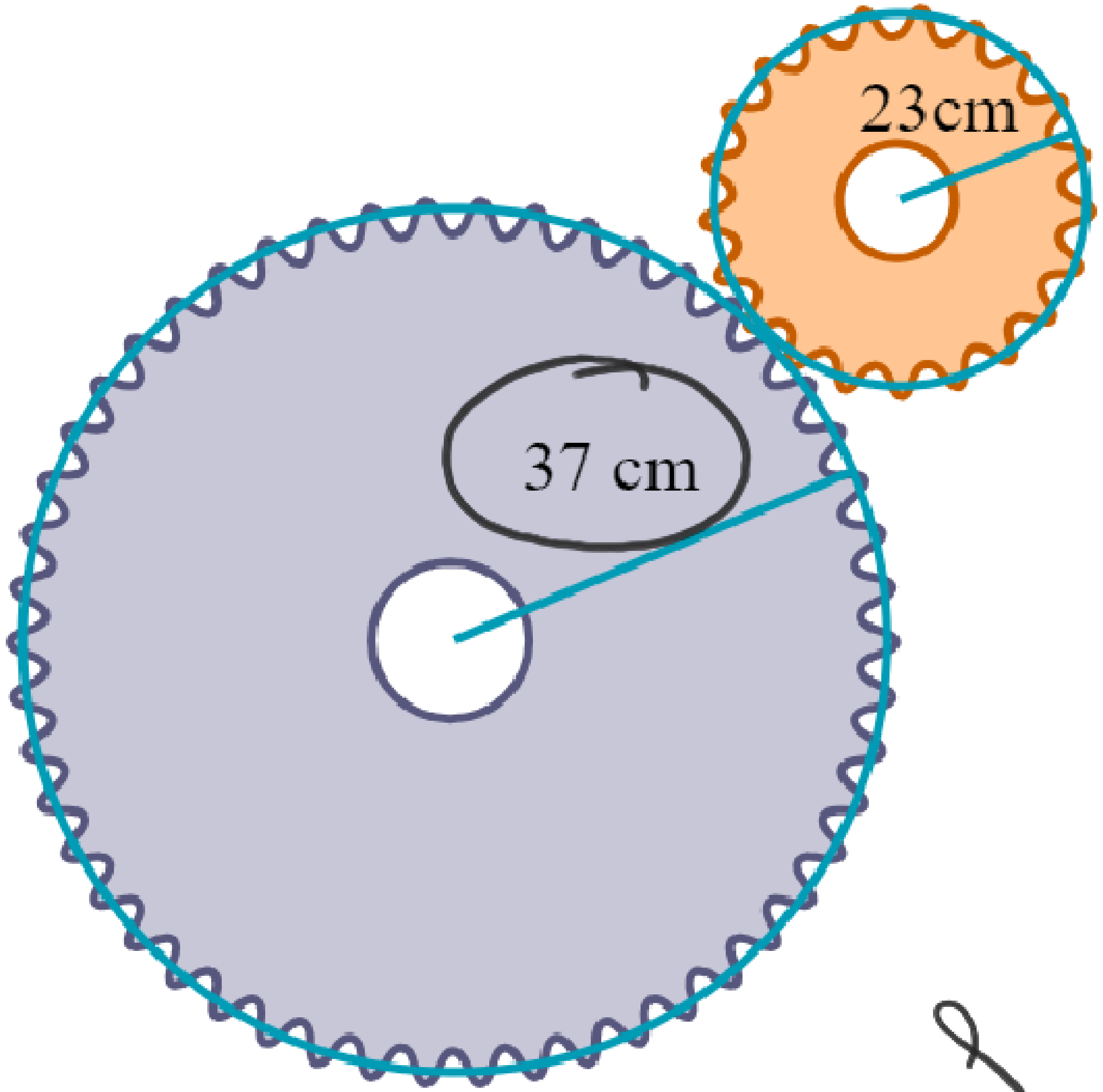
$$\theta = 110$$

$$110 \times \frac{\pi}{180}$$



$$x = \underline{23\theta} \qquad \theta = 260$$

$$x =$$

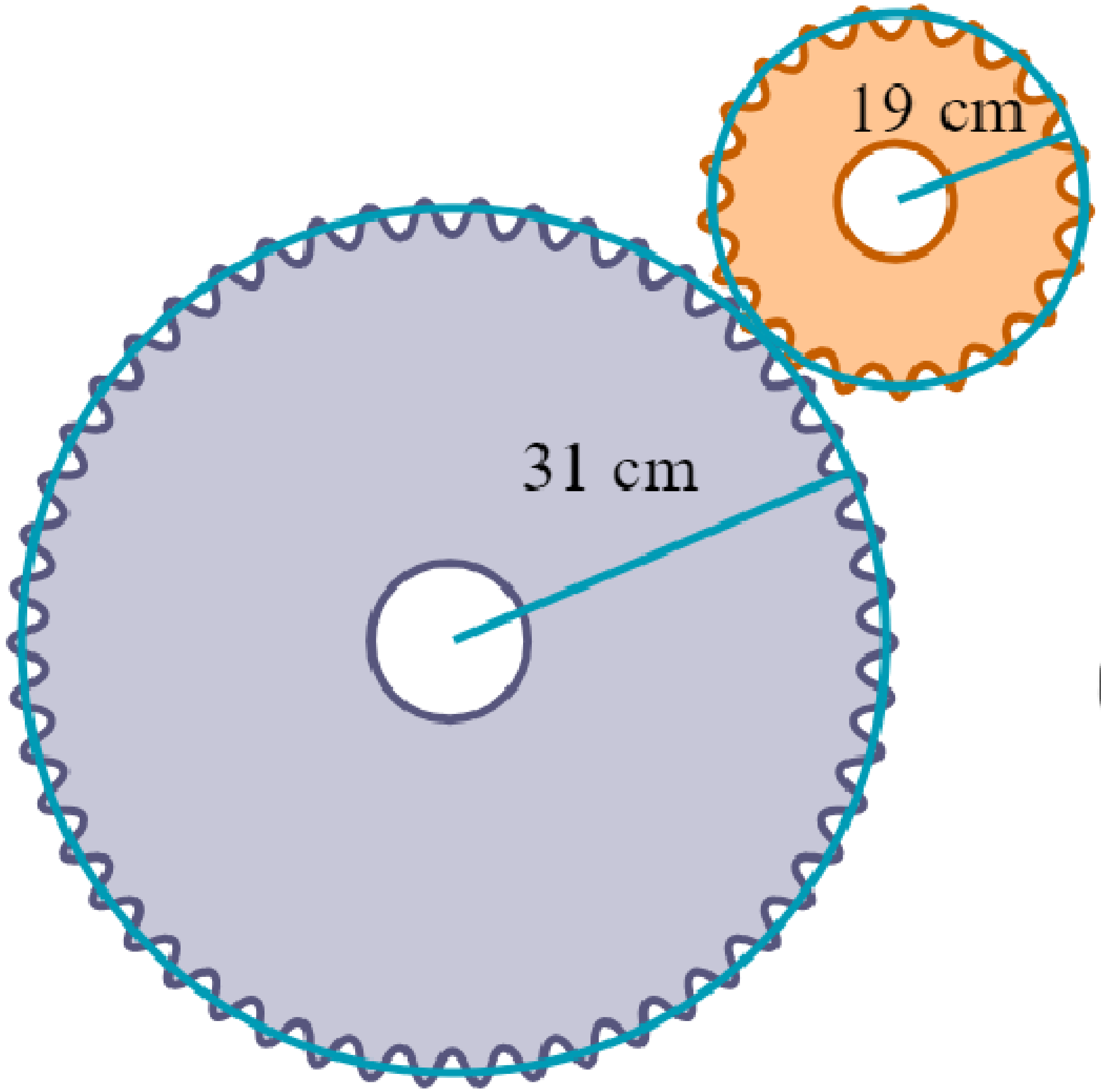


$\leftarrow \boxed{S = 23\,\theta_1}$

$$\frac{S}{23} = \theta_1$$

$$\frac{S}{37} = \theta_2 = \frac{23\,\theta_1}{37} = \theta_2$$

$$\theta_2 = \frac{23(6\pi)}{37} =$$



$S = 19\theta_1$

$\theta_2 = \frac{S}{31} = \frac{19\theta_1}{31}$

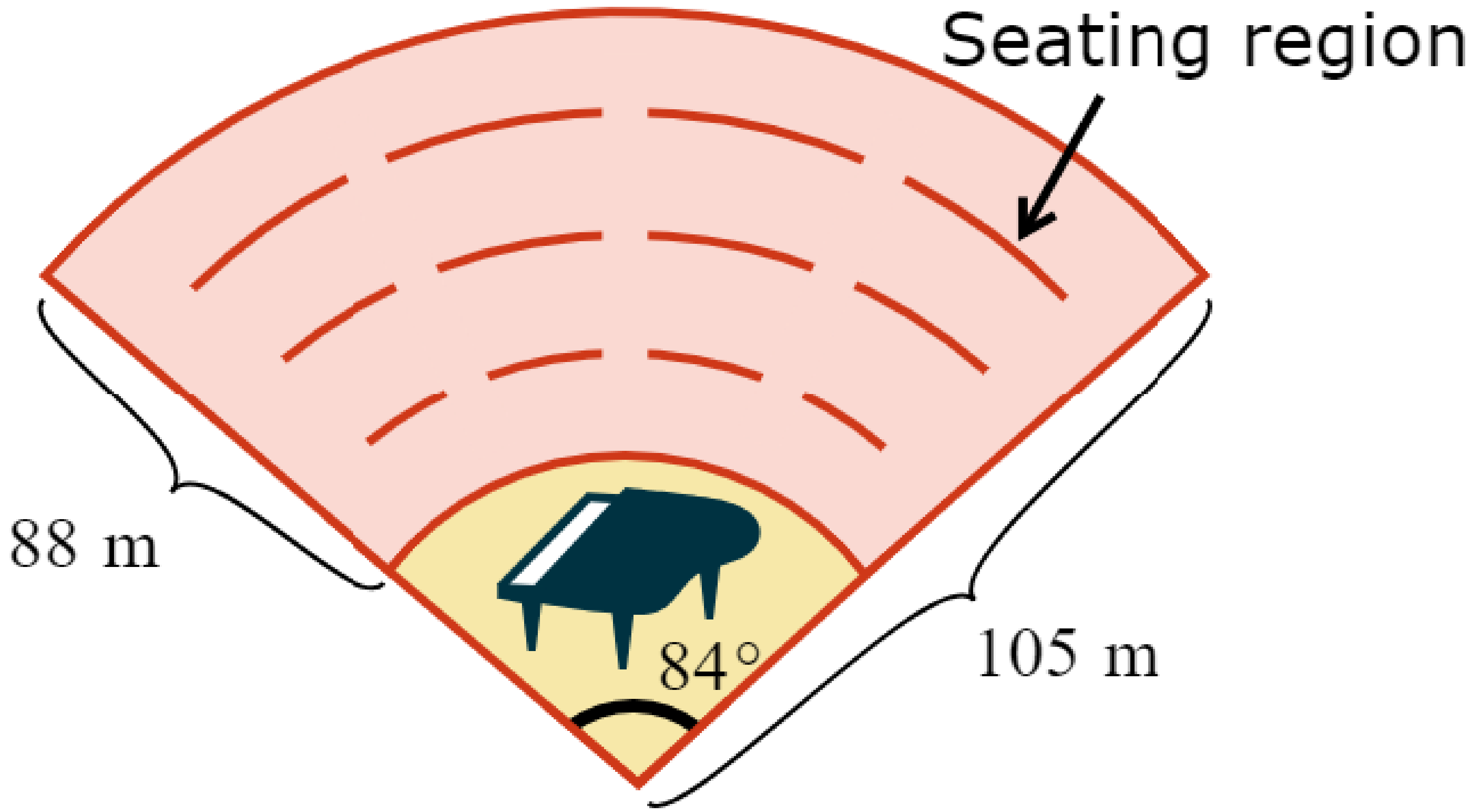
$\frac{19}{31}\left(\frac{2}{3}\right) = \frac{38}{93}\pi$

A circle has a radius of 8mm. A sector of the circle has a central angle of $\frac{4\pi}{3}$ radians. Find the area of the sector.

$$A = \pi r^2 \rightarrow A = \frac{\theta}{2\cancel{\pi}} \cancel{\pi} r^2$$

$$A = \frac{\theta}{2} r^2$$

$$A = \frac{1}{2}\left(\frac{4\pi}{3}\right)(8)^2 = 134.0$$



$$A = \frac{1}{2}\theta r^2$$

$$84 \times \frac{\pi}{180} = \frac{84\pi}{180}$$

$$A_w = \frac{1}{2}\left(\frac{84\pi}{180}\right)(105)^2$$

$$A_s = \frac{1}{2}\left(\frac{84\pi}{180}\right)(17)^2$$

Suppose that Jupiter rotates on its axis once every 10 hours. The equator lies on a circle with a diameter of $88{,}846$ miles.

(a) Find the angular speed of a point on its equator in radians per day (24 hours). 15 radians

(b) Find the linear speed of a point on the equator in miles per day.

Do not round any intermediate computations, and round your answer to the nearest whole number.

$$A = \frac{2\pi}{10\text{ hours}} \times \frac{24\text{ hours}}{1\text{ day}} = 15.08$$

$$\text{angular } \omega = \frac{\theta}{t}$$

$$\text{Linear } V = \frac{r\theta}{t}$$

$$L \rightarrow 15.08(44{,}423)$$

$$L = 669883 \text{ m.p.d.}$$