

The Weekly Rigor

No. 250

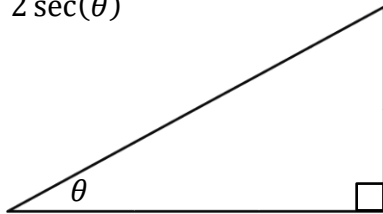
“A mathematician is a machine for turning coffee into theorems.”

April 6, 2019

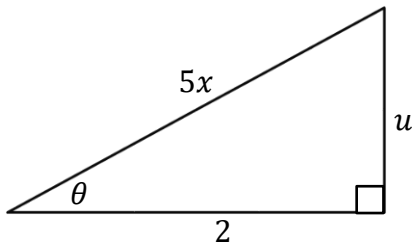
15 Problems in Solving Right Triangles (Part 3 of 4)

(Part 7)

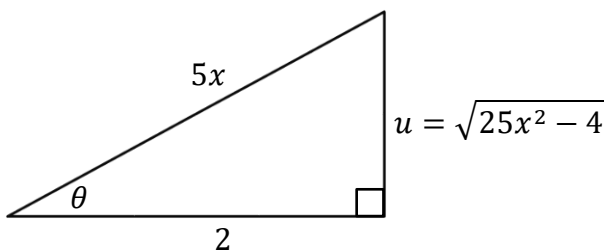
13. $5x = 2 \sec(\theta)$



$$5x = 2 \sec(\theta) \Rightarrow \frac{5x}{2} = \sec(\theta) \Rightarrow \frac{2}{5x} = \cos(\theta)$$



$$u^2 + 2^2 = (5x)^2 \Rightarrow u = \sqrt{25x^2 - 4}$$

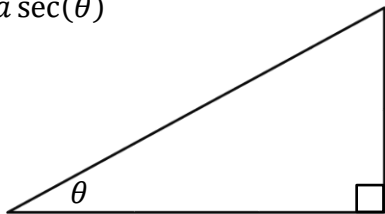


$$\sin(\theta) = \frac{\sqrt{25x^2 - 4}}{5x} \quad \csc(\theta) = \frac{5x}{\sqrt{25x^2 - 4}}$$

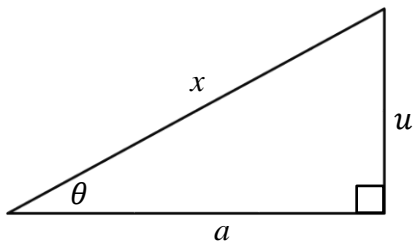
$$\cos(\theta) = \frac{2}{5x} \quad \sec(\theta) = \frac{5x}{2}$$

$$\tan(\theta) = \frac{\sqrt{25x^2 - 4}}{2} \quad \cot(\theta) = \frac{2}{\sqrt{25x^2 - 4}}$$

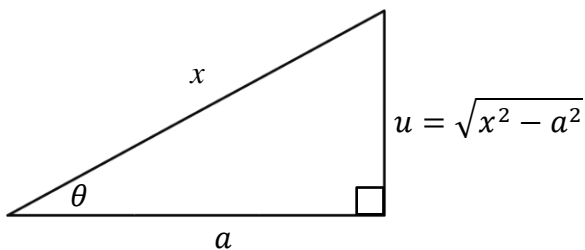
15. $x = a \sec(\theta)$



$$x = a \sec(\theta) \Rightarrow \frac{x}{a} = \sec(\theta) \Rightarrow \frac{a}{x} = \cos(\theta)$$



$$u^2 + a^2 = x^2 \Rightarrow u = \sqrt{x^2 - a^2}$$



$$\sin(\theta) = \frac{\sqrt{x^2 - a^2}}{x} \quad \csc(\theta) = \frac{x}{\sqrt{x^2 - a^2}}$$

$$\cos(\theta) = \frac{a}{x} \quad \sec(\theta) = \frac{x}{a}$$

$$\tan(\theta) = \frac{\sqrt{x^2 - a^2}}{a} \quad \cot(\theta) = \frac{a}{\sqrt{x^2 - a^2}}$$

“Only he who never plays, never loses.”