Topic: The quotient identities

Question: Which of the following is equivalent to the ratio?

$$\frac{\cos\theta}{\sin\theta}$$

Answer choices:

A $\sec\theta$

B $\tan\theta$

C $\cot\theta$

D $\csc\theta$

Solution: C

The quotient identity for cotangent tells us that

$$\cot\theta = \frac{\cos\theta}{\sin\theta}$$

Topic: The quotient identities

Question: Which expression is equivalent to the given fraction?

$$\frac{1}{\tan\theta}$$

Answer choices:

A $\dfrac{\sin\theta}{\cos\theta}$

B $\dfrac{1}{\cos\theta}$

C $\dfrac{1}{\sin\theta}$

D $\dfrac{\cos\theta}{\sin\theta}$

Solution: D

Using the reciprocal identities, we remember that

$$\cot\theta = \frac{1}{\tan\theta}$$

And from the quotient identity for cotangent, we get

$$\cot\theta = \frac{\cos\theta}{\sin\theta}$$

Topic: The quotient identities

Question: If $\sin\theta = 8/17$ and $\cos\theta = 15/17$, what is the value of $\tan\theta$?

Answer choices:

A $\frac{8}{15}$

B $\frac{17}{15}$

C $\frac{15}{8}$

D $\frac{17}{8}$

Solution: A

We can find tangent of θ just by plugging these sine and cosine values into the quotient identity for tangent.

$$\tan\theta = \frac{\sin\theta}{\cos\theta}$$

$$\tan\theta = \frac{\frac{8}{17}}{\frac{15}{17}}$$

$$\tan\theta = \frac{8}{17} \cdot \frac{17}{15}$$

$$\tan\theta = \frac{8}{15}$$