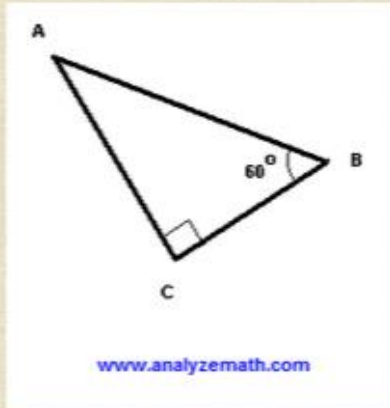
Answer 55

55. In the right triangle ABC, C is a right angle and the measure of angle B is 60°. If $\overline{BC}$ is 20 inches long, then how long is $\overline{AC}$?



A) 20√3
B) 20
C) √3
D) 40
E) 20/√3

In this triangle, with B as the reference angle, BC is the adjacent side (20”) and AC is the opposite.

Since Tangent is defined as $\frac{opp}{adj}$, that Trig function will be the best option.

$$\tan 60 = \frac{x}{20}$$

$$20 \tan 60 = x$$

The complication then, is what is tan(60)? Recall:

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

You should also have memorized the values for Sine and Cosine for 30-60-90 and 45-45-90 triangles.

$$\sin 60 = \frac{\sqrt{3}}{2} \ and \ \cos 60 = \frac{1}{2}$$

Therefore:

$$\tan 60 = \frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \frac{\sqrt{3}}{2} * \frac{2}{1} = \sqrt{3}$$

Therefore, the answer is $20\sqrt{3}$, or answer A.