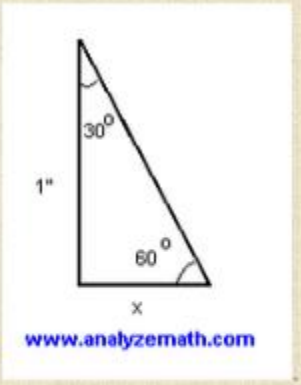
Answer 45

45. The measures of the sides of the right triangle below are in inches. What is the value of x?



A) 1/√3
B) √2
C) √3
D) 6/√3
E) 2/√3

We'll have to use Trig for this answer, and it won't be as straightforward as if we knew the length of the hypotenuse.

Tangent will probably be the easiest ratio, using the 30 degree angle as the reference angle. An alternative would be Cotangent using the 60.

$$\tan 30 = \frac{x}{1} \quad so \ \tan 30 = x$$

The complication then, is what is tan(30)? 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.

$$\sin 30 = \frac{1}{2} \ and \ \cos 30 = \frac{\sqrt{3}}{2}$$

Therefore:

$$\tan 30 = \frac{\frac{1}{2}}{\frac{\sqrt{3}}{2}} = \frac{1}{2} * \frac{2}{\sqrt{3}} = \frac{1}{\sqrt{3}}$$

Note that this matches answer A, and the radical in the denominator did not have to be rationalized, so A.