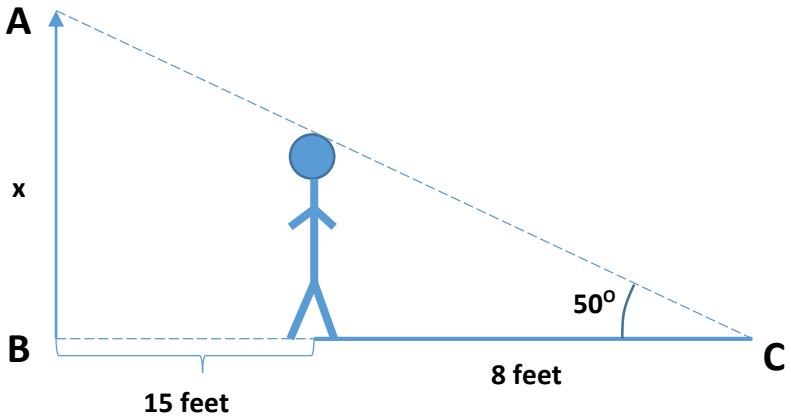
Answer on Question #57984 – Math – Trigonometry

Question

Dr. Black is standing 15 feet from a street lamp. The lamp is making his shadow 8 feet long. He estimates that the angle of elevation from the tip of his shadow to the top of the street lamp is 50°. To the nearest foot, the street lamp is about_____ft.

Solution



In the triangle ABC one leg is equal to 23 feet and the other one is unknown one, we will denote it by x.

According to the definition of tangent,

$\tan \angle ACB = \tan 50^o = x/(15+8)$, hence

$x = \tan 50^o \times 23 \text{ (feet)} \approx 1.19 \times 23 \text{ (feet)} = 27.37 \text{ (feet)} \approx 27 \text{ (feet)}$

Answer: 27 feet.

Question

If $\sin\theta > 0$ and $\tan\theta < 0$ then:

A: $90° < \theta < 180°$
B: $0° < \theta < 90°$
C: $180° < \theta < 270°$
D: $270° < \theta < 360°$

Solution

If $\sin\theta > 0$, then θ belongs to $(0; 180°)$.

By definition of tangent, $\tan\theta = \sin\theta/\cos\theta$.

If $\sin\theta > 0$ and $\tan\theta < 0$, then $\cos\theta < 0$.

If $\cos\theta < 0$, then θ belongs to $(90°; 270°)$.

Take into account both conditions.

Thus, θ belongs to $(90°; 180°)$.

Answer: A: $90° < \theta < 180°$.