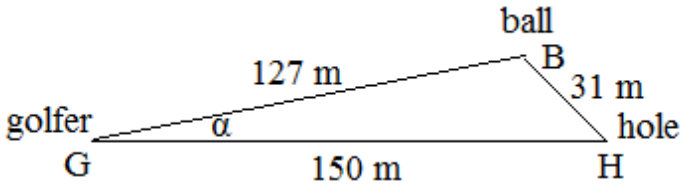
Answer on Question #75064, Math / Trigonometry

A golfer hits her ball a distance of 127 m so that it finishes 31 m from the hole. If the length of the hole is 150 m, calculate the angle between the line of her shot and direct line to the shot.

Solution



Consider the triangle ΔGBH

$$GH = 150, BH = 31, GB = 127, \angle BGH = \alpha$$

The Law of Cosines

$$(BH)^2 = (GH)^2 + (GB)^2 - 2(GH)(GB)\cos(\angle BGH)$$

Substitute

$$(31)^2 = (150)^2 + (127)^2 - 2(150)(127)\cos\alpha$$

Solve for α

$$\cos\alpha = \frac{22500 + 16129 - 961}{38100} = \frac{3139}{3175}$$

$$\alpha = \arccos\left(\frac{3139}{3175}\right) \approx 8°38'$$

Answer: $\approx 8°38'$.