A professional golfer hits the golf ball with a velocity of 182 feet per second off the ground.

a. If the ball hits the green(ground) **174 yards** away, at what angle was the ball launched at?

$X = 182\cos\theta\, t$

$522 = 182\cos\theta\, t$

$t = \frac{522}{182\cos\theta}$

$y = -16t^2 + 182\sin\theta\, t$

$= -\frac{16}{1}\left(\frac{522}{182\cos\theta}\right)^2 + 182\sin\theta\left(\frac{522}{182\cos\theta}\right)$

$= -\frac{133.62}{\cos^2\theta} + 522\tan\theta$

$\theta = 15.1°$

b. What is the maximum height of the golf ball during this shot?

$y = -16t^2 + 182\sin 15.1°\, t$

$y = -16t^2 + 47.41t$

$0 = -16t^2 + 47.41t$

$0 = t(-16t + 47.41)$

$t = 0$ $\qquad 0 = -16t + 47.41$

$16t = 47.41$

$t = \frac{47.41}{16} \approx 2.96$

$y = -16(1.48)^2 + 182\sin(15.1)(1.48)$

$= 35.123$ ft