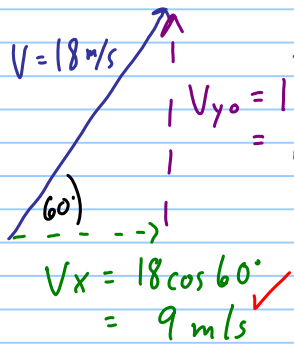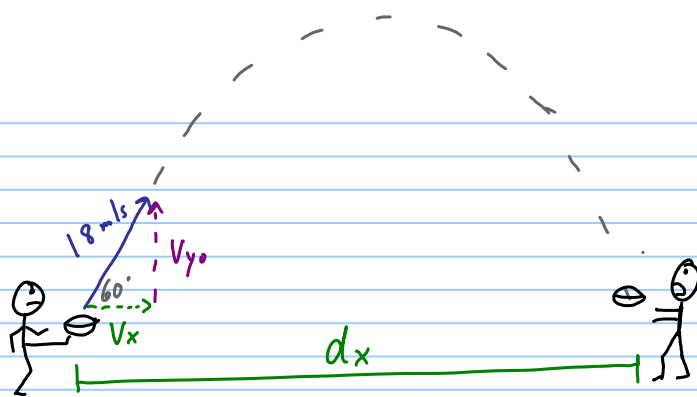A rugby player kicks a ball at 18 m/s 60° above the horizontal and it is caught by an opposing player.

How far downfield does the ball travel?

$V = 18\,m/s$

$V_{yo} = 18\sin 60$
$= 15.59$

$V_x = 18\cos 60°$
$= 9\,m/s$ ✓

**x**

$V_x = 9\,m/s$
$d_x = ?$
$t =$

$V_x = \dfrac{d_x}{t}$

$d_x = V_x\,t$
$= (9\,m/s)(3.181s)$
$= \boxed{29\,m}$ ✓

**y**

$V_y = -15.59$ ← $V = -V_o$ because it come back down to the same height
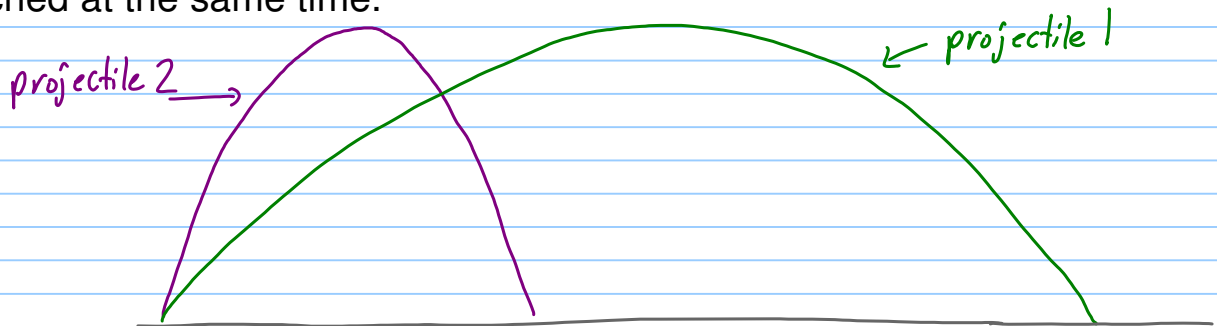$V_{yo} = 15.59$
$a_y = -9.8\,m/s^2$
$d_y =$
$t =$

$V = V_o + a\,t$ ✓

$t = \dfrac{V - V_o}{a}$

$= \dfrac{-15.59 - 15.59}{-9.8}$

$= 3.181\,s$ ✓

**True or False** - Consider the following trajectories. Both projectiles were launched at the same time.



projectile 2 →

← projectile 1

1) Both projectiles spend the same amount of time in the air.

2) The initial speed of projectile 1 is greater than that of projectile 2.