A2 with Mechanics Kappa test version O

1. An arrow is fired from a bow with a speed of 50 ms^{-1} at an angle of 5^o above the horizontal.

   (a) Calculate the height of the arrow after 0.6 s.

   (b) What is its speed after 6 s?

   (c) Find the acute angle that the arrow makes with the horizontal after 6 s?

2. A bowler releases a cricket ball from a height of 2.25 m above a horizontal cricket pitch so that initially its path is horizontal.

   (a) Find the speed of delivery if it is to hit the ground a horizontal distance of 16m from the point of release.

   (b) Find the speed that the ball hits the ground.

   Next ball, the bowler again releases the ball from a height of 2.25m, but at a speed of $28ms^{-1}$ at an angle of 4^o <u>below</u> the horizontal.

   (c) Find the time taken for the ball to first hit the ground.

   (d) Find the horizontal distance travelled when the ball first hits the ground.

A2 with Mechanics Kappa test version P

1. An arrow is fired from a bow with a speed of 40 ms^{-1} at an angle of 10^o above the horizontal.

   (a) Calculate the height of the arrow after 0.6 s.

   (b) What is its speed after 6 s?

   (c) Find the acute angle that the arrow makes with the horizontal after 6 s?

2. A bowler releases a cricket ball from a height of 2.25 m above a horizontal cricket pitch so that initially its path is horizontal.

   (a) Find the speed of delivery if it is to hit the ground a horizontal distance of 20m from the point of release.

   (b) Find the speed that the ball hits the ground.

   Next ball, the bowler again releases the ball from a height of 2.25m, but at a speed of 28ms^{-1} at an angle of 4^o below the horizontal.

   (c) Find the time taken for the ball to first hit the ground.

   (d) Find the horizontal distance travelled when the ball first hits the ground.

A2 with Mechanics Kappa test version Q

1. An arrow is fired from a bow with a speed of 60 ms^{-1} at an angle of 5^o above the horizontal.

   (a) Calculate the height of the arrow after 0.6 s.

   (b) What is its speed after 6 s?

   (c) Find the acute angle that the arrow makes with the horizontal after 6 s?

2. A bowler releases a cricket ball from a height of 2.25 m above a horizontal cricket pitch so that initially its path is horizontal.

   (a) Find the speed of delivery if it is to hit the ground a horizontal distance of 24m from the point of release.

   (b) Find the speed that the ball hits the ground.

   Next ball, the bowler again releases the ball from a height of 2.25m, but at a speed of 26 ms^{-1} at an angle of 4^o <u>below</u> the horizontal.

   (c) Find the time taken for the ball to first hit the ground.

   (d) Find the horizontal distance travelled when the ball first hits the ground.

A2 with Mechanics Kappa test version R

1. An arrow is fired from a bow with a speed of 50 ms^{-1} at an angle of 8^o above the horizontal.

   (a) Calculate the height of the arrow after 0.6 s.

   (b) What is its speed after 6 s?

   (c) Find the acute angle that the arrow makes with the horizontal after 6 s?

2. A bowler releases a cricket ball from a height of 2.25 m above a horizontal cricket pitch so that initially its path is horizontal.

   (a) Find the speed of delivery if it is to hit the ground a horizontal distance of 26m from the point of release.

   (b) Find the speed that the ball hits the ground.

   Next ball, the bowler again releases the ball from a height of 2.25m, but at a speed of 25ms^{-1} at an angle of 4^o <u>below</u> the horizontal.

   (c) Find the time taken for the ball to first hit the ground.

   (d) Find the horizontal distance travelled when the ball first hits the ground.

Answers

O
1a) 0.85
b) 73.79
c) 47.5
2a) 23.6
b) 24.5
c) 0.51
d) 14.2

P
1a) 2.40
b) 65.12
c) 41.9
2a) 29.5
b) 30.2
c) 0.51
d) 13.7

Q
1a) 1.37
b) 80.26
c) 41.9
2a) 35.4
b) 36.0
c) 0.52
d) 13.5

R
1a) 2.41
b) 71.69
c) 46.3
2a) 38.4
b) 39.0
c)0.52
d) 13.0