

Type 1 Projectiles

1. A cliff diver is on a 30.0 m high cliff. With what velocity should they leave the cliff (assume the person jumps out horizontally) in order to miss 8.0 meters of rocks coming from the cliff's base?
(3.2 m/s)
2. A mountain goat butts you off a 50.0 m high cliff with a horizontal velocity of 3.0 m/s. How far from the base will you strike the ground?
(9.6 m)
3. A penny is thrown horizontally at 3.0 m/s off a high building. What will be its velocity after 2.0 seconds?
(20 m/s at 81° S of E)
4. A cat leaps off a 30.0 m high building. If it left the building with a horizontal velocity of 1.0 m/s, will it land safely on some garbage bags 5.0 m from the base of the building? (The cat does not land safely)
5. What will be the velocity of the cat in #4 at the exact moment of impact? (hint: it's not zero)
(24.2 m/s at 88° S of E)
6. A stunt person jumps at 5.0 m/s horizontally. If she lands on an airbag 24.2 m from the base of the building, how was it?
(116 m)
7. A kid runs 2.0 m/s off a cliff that is 5.0 m high. If rock extends 3.0 m outward from the base, will the kid clear the rocks making a perfect dive into the lake or suffer a debilitating neck injury?
(Unfortunately, the kid gets hurt)
8. A supply aircraft is flying horizontally at 45 m/s at a height of 200 m above the deck of a cruise ship. If it drops food to the disabled ship, how far in front of the ship must the plane release the supplies?
(287 m)
9. A bomb is dropped from a plane flying horizontally at 200 m/s from a height of 2.0 km. Find the bomb's velocity:
 - a) after 10 seconds
(223 m/s at 26° S of E)
 - b) after having fallen to a height of 500 m
(263 m/s at 41° S of E)
10. What is the velocity of an object which is thrown at 5.0 m/s horizontally when it reaches the bottom of a 10.0 m high cliff?
(15 m/s at 70° S of E)