

Name: _____

1. Substitute the given quantities into the following equations to find the unknown quantity.

(a) $E = \frac{mv^2}{2} + mgh$

Find E if $m = 8.4$, $v = 14$, $g = 9.8$ and $h = 20$

(b) $s = ut + \frac{1}{2}at^2$

Find s if $u = 8.5$, $t = 6.2$ and $a = -2.5$

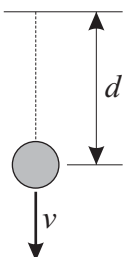
(c) $x = \frac{-b - \sqrt{b^2 - 4ac}}{2a}$

Find x if $a = 12$, $b = -2$ and $c = -30$

2. The velocity (v), in m/s, of an object after it has fallen a distance (d), in m, can be calculated using the following formula.

$$v = \sqrt{2gd}$$

Where $g = 9.8 \text{ m/s}^2$



Find the velocity, in m/s, of an object that has fallen 25 m.

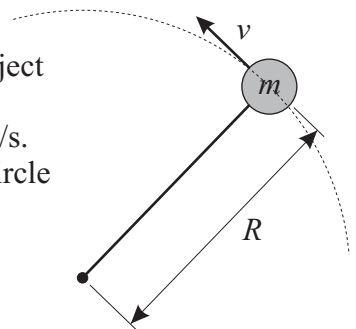
Give answer correct to one decimal place.

3. (a) Transpose the formula from question 2 to make d the subject.

(b) Find the distance an object has fallen if it has reached a velocity of 35.6 m/s. Give answer correct to one decimal place.

4. The object shown below is attached to a string and is travelling in a circular path.

The mass of the object is m kg.
The velocity is v m/s.
The radius of the circle is R m.



The tension, T , in the string can be calculated by using the following formula.

$$T = \frac{mv^2}{R}$$

The unit of tension is Newtons (N).

(a) Find the tension in the string if the mass is 1.4 kg, its velocity is 1.5 m/s and the radius of the circle is 2 m.

(b) Find the tension in the string if the mass is 400 g, the velocity is 5.6 m/s and the radius of the circle is 88 cm.

Give answer correct to one decimal place.