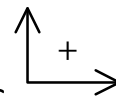


P11 - 3.2 - $F = ma$, $F_f = \mu F_n$ Solve Variable Notes



A Pull Force of 45 N is applied to a 15kg object. Find its acceleration.

A Push Force of 12 N on an object's $a = 2 \frac{m}{s^2}$, Find object's Mass and Weight?

$a = ? = 3$

$F = ma$
 $a = \frac{F}{m}$
 $a = \frac{45}{15}$
 $a = 3 \frac{m}{s^2}$

$F_f = 0$
 $F_g = mg$
 $F_g = 15 \times 9.8$
 $F_g = 147 N$

$a = 2 \frac{m}{s^2}$

$F = ma$
 $m = \frac{F}{a}$
 $m = 6 kg$

$F_f = 0$
 $F_g = mg$
 $F_g = 6 \times 9.8$
 $F_g = 58.8 N$

Weight = F_n

A Pull Force of 92 N on a 15 kg object's $a = 5 \frac{m}{s^2}$. What is the Frictional Force?

$a = 5 \frac{m}{s^2}$

$F = ma$
 $F_p - F_f = ma$
 $F_f = F_p - ma$
 $F_f = 92 - 15 \times 5$
 $F_f = 17 N$

$F_g = mg$
 $F_g = 15 \times 9.8$
 $F_g = 147 N$

How far did the object go in 5s?

$$\Delta d = v_i t + \frac{1}{2} a t^2$$

$$d = (0)t + \frac{1}{2} (5)(5)^2$$

$$d = 62.5 m$$

Acceleration is the Kinematics - Dynamics Link

t	d
0	0
1	2.5
2	10
3	22.5
4	40
5	62.5

What is the velocity after 2 seconds?

$$v_f = v_i + at$$

$$v_f = 0 + 5(2)$$

$$v_f = 10 \frac{m}{s}$$

How long until it reaches $25 \frac{m}{s}$.

$$v_f = v_i + at$$

$$25 = 0 + 5t$$

$$t = 5s$$

t	v
0	0
1	5
2	10
3	15
4	20
5	25

Find the Push Force to $a = 2 \frac{m}{s^2}$ a 15kg object, with a Frictional Co-efficient of $\mu = 0.3$?

μ : Frictional Co-efficient (Mhew) No Units.

Higher the Mhew, μ , Higher the Frictional Force.

$a = 2 \frac{m}{s^2}$

$F_f = \mu F_n$
 $F_f = \mu F_n$
 $F_f = 0.3 \times 147$
 $F_f = 44.1 N$

$F_g = mg$
 $F_g = 15 \times 9.8$
 $F_g = 147 N$

$F = ma$
 $F_p - F_f = ma$
 $F_p = ma + f_f$
 $F_p = 15 \times 2 + 44.1$
 $F_p = 74.1 N$