

# Chapter 4

## Review

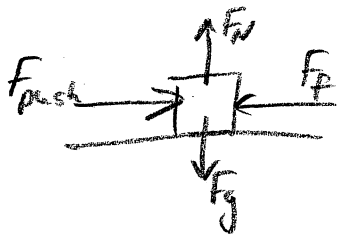
- (1) B      (2) A      (3) B      (4) B  
(5) D      (6) B      (7) C      (8) A  
(9) B      (10) A      (11) A  
(12) A      (13) B      (14) A      (15) B  
(16) C      (17) A      (18) A      (19) A  
(20) B

(21) B  $F = mg$   $g_{\text{moon}} = 1.67 \text{ m/s}^2$   
 $= (1)(1.67)$   
 $= 1.67 \text{ N}$

(22) A The scale is calibrated for Earth.  
It reads 55 kg when the force (weight)  
is  $F = mg = (55)(9.8) = 539 \text{ N}$   
On the moon, the force is  
 $F = mg = (55)(1.67) = 91.85 \text{ N}$   
Therefore  $\frac{91.85}{539} = \frac{x}{55}$   $x = 9.4$

The scale will read "9.4 kg"

(23) D



$$F_{net} = ma$$

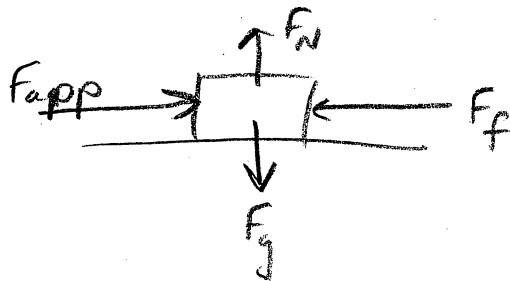
$$F_{push} - F_f = ma$$

$$F_{push} = ma + f_f$$

$$= (5)(18) + 10$$

$$= 100 \text{ N}$$

(24)



$$F_{net} = ma$$

$$F_{app} - f_f = ma$$

$$560 - 45 = (2000 + 55 + 55) a$$

(25) C

(26) A

(27) A

(28) A

(29) A

(30) A

(31) B

(32) C

(33) D

(34) B

$$F_{net} = ma$$

$$2F_{push} - F_f = ma$$

$$F_{push} = \frac{ma + F_f}{2} = \frac{2000(5) + 300}{2} = 5150$$

*F<sub>push</sub> from one person:*

(35) C

(36) A

(37) A

$$F_{\text{net}} = ma$$

$$F_{\text{app}} - F_f = ma$$

$$160 - F_f = (55 + 10)(2)$$

$$F_f = 30 \text{ N}$$

(38) D

$$F_{\text{net}} = ma$$

$$F_{\text{push}} - F_f = ma$$

$$F_{\text{push}} - 100 = 65(6)$$

$$F_{\text{push}} = 490 \text{ N}$$

(39) A

(40) A

(41) D

(42) C

(43) A

(44) A

(45) C

(46) A

(47) C

(48) B

(49) C

$$\begin{aligned} \text{Earth } F &= mg \\ &= 5(9.8) \\ &= 49 \text{ N} \end{aligned}$$

$$\begin{aligned} \text{moon } F &= mg \\ &= 5(1.67) \\ &= 8.35 \end{aligned}$$

(50) A

$$\begin{aligned} \text{Earth } F &= mg \\ M &= \frac{F}{g} = \frac{294}{9.8} = 30 \text{ kg} \end{aligned}$$

$$\begin{aligned} \text{Moon } F &= mg \\ &= 30(1.67) \\ &= 50.1 \text{ N} \end{aligned}$$

(51) B

(52) B

(53) A

(54) B

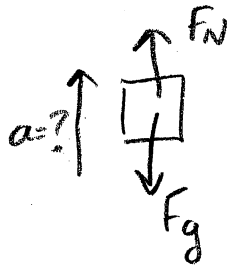
(55) B

(56) B

(57) B

(58) B

(59) A



$F_N$  is the number on the scale.

$$F_{net} = ma$$

$$F_N - F_g = ma$$

$a$  is +ve if  $F_N > F_g$

$a$  is -ve if  $F_N < F_g$

in this case  $F_N > F_g$ , therefore  $a$  is +ve (up)

(60) B

at terminal velocity.

$$F_g = F_{air} \quad \text{so } F_g \neq 0$$

(61) D

(62) C