

$$5. \quad a = ? \quad m = 120 \text{ kg}$$

$$F_1 = 32 \text{ N}, 30^\circ = (27.7\hat{i} + 16\hat{j}) \text{ N}$$

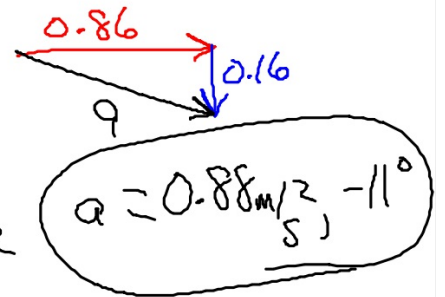
$$F_2 = 55 \text{ N}, 0^\circ = (55\hat{i} + 0\hat{j}) \text{ N}$$

$$F_3 = 41 \text{ N}, -60^\circ = (20.5\hat{i} - 35.5\hat{j}) \text{ N}$$

$$\Sigma F = (103.2\hat{i} - 19.5\hat{j}) \text{ N}$$

$$a = \frac{\Sigma F}{m} = \frac{103.2\hat{i} - 19.5\hat{j}}{120}$$

$$= (0.86\hat{i} - 0.163\hat{j}) \text{ m/s}^2$$



8. $F_3 = ?$ $a = (-8\hat{i} + 6\hat{j}) \text{ m/s}^2$

$$F_1 = (30\hat{i} + 16\hat{j}) \text{ N}$$

$$m = 2 \text{ kg}$$

$$F_2 = (-12\hat{i} + 8\hat{j}) \text{ N}$$

$$a = \frac{\Sigma F}{m}$$

$$(-8\hat{i} + 6\hat{j}) = \frac{\Sigma F}{2}$$

$$-16\hat{i} + 12\hat{j} = \Sigma F$$

$$\Sigma F = F_1 + F_2 + F_3$$

$$F_3 = \Sigma F - (F_1 + F_2) = (-16\hat{i} + 12\hat{j}) - [(30\hat{i} + 16\hat{j}) + (-12\hat{i} + 8\hat{j})]$$

$$F_3 = (-34\hat{i} - 12\hat{j}) \text{ N}$$

21. $F_a = ?$ $m = 2 \text{ kg}$

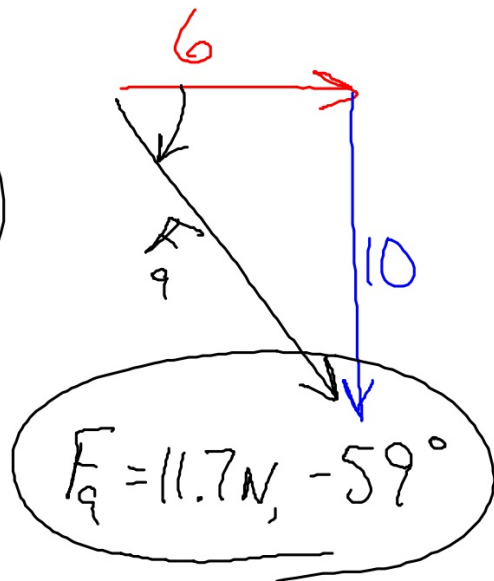
from graphs (slope of $V_{rst} = \text{acce!}$.)

$$a_x = 3 \text{ m/s}^2 \quad a_y = -5 \text{ m/s}^2$$

$$\Sigma F = ma$$

$$F_a = 2 \text{ kg} (3\hat{i} - 5\hat{j})$$

$$F_a = (6\hat{i} - 10\hat{j}) \text{ N}$$



28. a + b $\Sigma F = ?$ $t = ?$

$$V_0 = 11.1 \text{ m/s} \quad V_f = 0 \quad \Delta x = 15 \text{ m}$$

$$F_g = 1.3 \times 10^4 \text{ N}$$

$$\Sigma F = ma$$

$$m = \frac{F_g}{g} = \frac{1.3 \times 10^4}{9.8} = \underline{1327 \text{ kg}}$$

$$V_f^2 = V_0^2 + 2a(\Delta x) \quad a = \frac{V_f^2 - V_0^2}{2(\Delta x)}$$

$$\Sigma F = (1327)(-4.107)$$

$$\underline{\Sigma F = 5450 \text{ N}}$$

$$a = \frac{0 - (11.1)^2}{2(15)}$$

$$a = \underline{-4.107 \text{ m/s}^2}$$

$$V_f = V_o + at$$

$$t = \frac{V_f - V_o}{a} = \frac{0 - 11.1}{-4.107} = 2.7 \text{ sec}$$

c + d $V_o = 22.2 \text{ m/s}$ $V_f = 0$ $a = -4.107 \text{ m/s}^2$

$\Delta x = ?$ $t = ?$

$$\Delta x = \frac{V_f^2 - V_o^2}{2(a)} = \frac{0 - 22.2^2}{2(-4.107)} = 60 \text{ m}$$

4x as far

$$V_f = V_o + at \quad t = \frac{V_f - V_o}{a} = \frac{0 - 22.2}{-4.107} = 5.4 \text{ s}$$