

نموذج إجابة مادة الديناميكا (باللغة الإنجليزية) شهادة إتمام الدراسة الثانوية العامة - الدور الثاني - العام الدراسي ٢٠١٧/٢٠١٨

النموذج (ج)

١

1-

(C) 1000 Newton

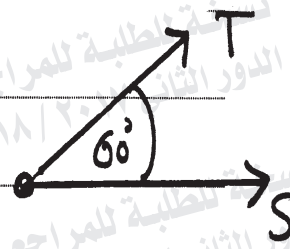


2-

(b) 1



3-

$$a = \frac{5}{100} \text{ m/sec}^2, t = 30 \text{ sec}$$


$$\therefore S = ut + \frac{1}{2} at^2$$

$$S = 0 + \frac{1}{2} \times \frac{5}{100} \times (30)^2 = 22.5 \text{ meter}$$

$$W = FS \cos 60^\circ$$

$$= 500 \times 9.8 \times 22.5 \times \frac{1}{2} = 55125 \text{ Joule}$$

4-

$$\text{Power} = F \times v$$

$$210 \times 75 = F \times 63 \times \frac{5}{18}$$

$$F = 900 \text{ Kg.wt.}$$

$$F = R + w \sin \alpha$$

$$R = F - w \sin \alpha$$

$$R = 900 - 6 \times 10^3 \times \frac{1}{100} = 840 \text{ Kg.wt}$$

$$\text{The resistance per each ton} = \frac{840}{6}$$

$$= 140 \text{ Kg.wt /ton}$$

(تراعى الحلول الأخرى)

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النموذج (ج)

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5-

(d) 5



6-

(c) 1



7-

$$ma = T - mg$$

$$T = m(a + g)$$

$$T = 100 [9.8 + 0.25]$$

$$T = 1005 \text{ Newton}$$



[b] $F = 80 \text{ newton}$

$$mg \sin \theta = 10 \times 9.8 \times \frac{3}{5}$$

$$= 58.8 \text{ N}$$

$\therefore F > mg \sin \theta$

\therefore The motion upwards

$$\therefore -mg \sin \theta + F = ma$$

$$10a = 80 - 58.8$$

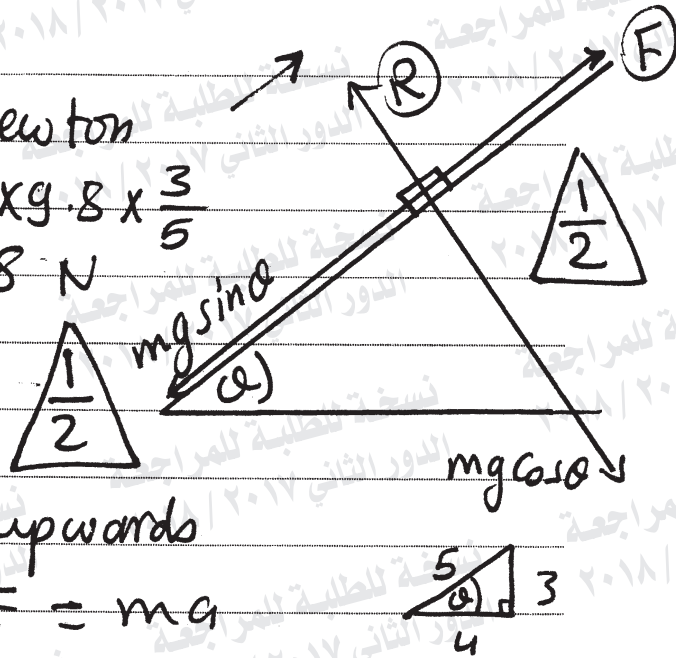
$$\therefore a = 2.12 \text{ m/sec}^2 \text{ upwards}$$

$$R = mg \cos \theta$$

$$R = 10 \times 9.8 \times \frac{4}{5}$$

$$R = 78.4 \text{ newton}$$

(تراعى الحلول الأخرى)



٥

8-

(b) 480



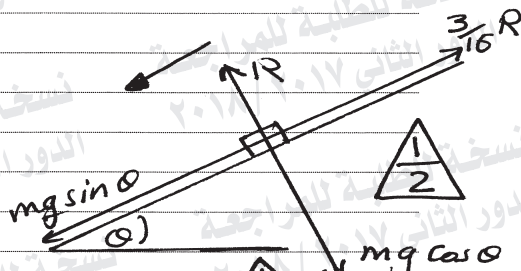
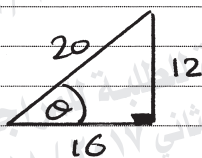
9-

(c) 180



10-

9



∴ the body desc.

$$\therefore ma = mg \sin \theta - \frac{3}{16} R$$

$$ma = mg \sin \theta - \frac{3}{16} \times mg \cos \theta$$

$$\therefore a = 9.8 \left[\frac{12}{20} - \frac{3}{16} \times \frac{16}{20} \right] = 4.41 \text{ m/sec}^2$$

$$v^2 = u^2 + 2gs$$

$$= 0 + 2 \times 4.41 \times 20 = 176.4$$

$$T = \frac{1}{2} mv^2 = \frac{1}{2} \times 60 \times 176.4 = 5292 \text{ Joule}$$

Another solutions:

$$T - T_0 = W$$

$$T - 0 = (mg \sin \theta - \mu R) s$$

$$T = \left[60 \times 9.8 \times \frac{12}{20} - \frac{3}{16} \times 60 \times 9.8 \times \frac{16}{20} \right] \times 20$$

$$T = 5292 \text{ Joule}$$

$$b) \vec{S} = \vec{r} - \vec{r}_0$$

$$\vec{S} = 2t^2 \vec{i} + 4t \vec{j}$$

$$W = \vec{F} \cdot \vec{S}$$

$$= (4, 5) \cdot (2t^2, 4t)$$

$$= 8t^2 + 20t$$

from $t = 0$ to $t = 2$

$$W = [8t^2 + 20t]_0^2 = 72 \text{ Joule}$$

∴ The change in potential energy = $-W$

$$= -72 \text{ Joule}$$

(تراعى الحلول الأخرى)

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النموذج (ج)

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11-

(b) 320



12-

(a) 0.1



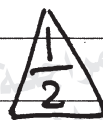
13-

$$\therefore V = 6t^2 - 24$$

when the velocity reaches 72 m/sec

$$\therefore 72 = 6t^2 - 24$$

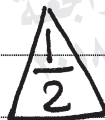
$$\therefore t = 4 \text{ sec.}$$



$$\text{at } V = 30 \text{ m/sec.}$$

$$\therefore 30 = 6t^2 - 24$$

$$\therefore t = 3 \text{ sec.}$$



$$\therefore a = \frac{dv}{dt} = 12t$$

$$\text{at } t = 3 \text{ sec.} \Rightarrow a = 12 \times 3 = 36 \text{ m/sec}^2$$

$$S = \int_1^4 v dt = \int_1^4 (6t^2 - 24) dt$$

$$S = [2t^3 - 24t]_1^4 = 32 + 22 = 54 \text{ meter}$$

14-

$$m_1 v_1 + m_2 v_2 = m_1 v_1' + m_2 v_2'$$

$$200 \times 20 = 600 \times 4$$

$$= -200 \times 16 + 600 v_2' \quad v_1 = 20 \quad v_2 = 4$$

$$1600 + 3200 = 600 v_2' \quad v_1' = 16$$

$v_2' = 8 \text{ m/sec.}$ $\frac{1}{2}$ The rebound velocity of 2nd ball $\frac{1}{2}$

$$I = m_1 (v_1' - v_1) = 200 (-16 - 20) \quad \frac{1}{2}$$

$$I = -7200$$

$$I = 7200 \text{ gm. m/sec.} \quad \frac{1}{2}$$

(تراعى الحلول الأخرى)

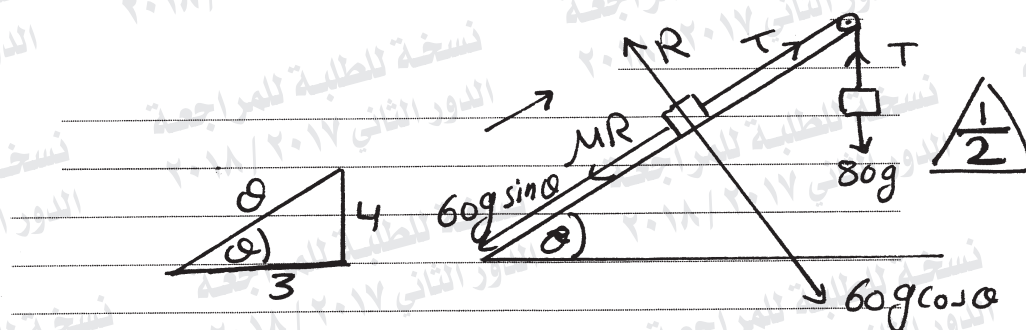
15-

(d) 5 \triangle

16-

(a) 100 \triangle

17-



$$\therefore u = 0, s = 49 \text{ cm}, t = 1 \text{ sec.}$$

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

$$\therefore 49 = 0 + \frac{1}{2} \times a \times 1$$

$$\therefore a = 98 \text{ cm/sec}^2 \triangle$$

$$R = 60g \cos \alpha = 36g \triangle$$

$$\therefore 80 > 60g \sin \alpha$$

\therefore the motion upwards

$$80a = 80g - T \triangle$$

$$60a = T - 60g \sin \alpha - MR \triangle$$

by adding.

$$140a = 80g - 60g \sin \alpha - MR$$

$$14 - 32 = -36 \mu$$

$$\mu_k = \frac{1}{2} \triangle$$

18-

$$\text{a) } I = \int_0^t F dt = \int_0^3 (3t^2 - 2t) dt = [t^3 - t^2]_0^3 = (27 - 9) = 18 \text{ Newton} \cdot \text{sec}$$

$$\text{b) } I = \int_3^4 (3t^2 - 2t) dt = [t^3 - t^2]_3^4 = (64 - 16) - (27 - 9) = 48 - 18 = 30 \text{ Newton} \cdot \text{sec}$$

(تراعى الحلول الأخرى)

انتهت الإجابة وتراعى الحلول الأخرى)