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Cool! I'am really happy

#Markus Jensen



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so many fake sites. this is the first one which worked! Many thanks

Solution DYNAMICS Meriam & Kraige 6th Edition US version / Chapter 1

10 $\vec{v} = \frac{d\vec{r}}{dt} = \frac{d}{dt} [2t^2\hat{i} + 3t^3\hat{j} + 4t^4\hat{k}] = 4t\hat{i} + 9t^2\hat{j} + 16t^3\hat{k}$
 (a) $v = \sqrt{16t^2 + 81t^4 + 256t^6}$
 (b) $\vec{v} = 4t\hat{i} + 9t^2\hat{j} + 16t^3\hat{k}$
 (c) $a = \frac{d\vec{v}}{dt} = 4\hat{i} + 18t\hat{j} + 48t^2\hat{k}$

11 For a 100-lb sphere
 $W = mg = 100 \text{ lb} = m(32.2 \text{ ft/s}^2)$
 $m = \frac{100}{32.2} = 3.106 \text{ slugs}$
 $W = mg = 3.106(32.2) = 100 \text{ lb}$
 $W = mg = 3.106(32.2) = 100 \text{ lb}$

12 $\vec{v}_1 = 10(\hat{i} + \hat{j})$, $\vec{v}_2 = 10\hat{i}$
 $\vec{v}_3 = 10(2\hat{i} + \hat{j})$, $\vec{v}_4 = 10\hat{j}$
 $\vec{v}_5 = 10(3\hat{i} + 2\hat{j})$, $\vec{v}_6 = 10\hat{k}$
 $\vec{v}_7 = 10(4\hat{i} + 3\hat{j})$, $\vec{v}_8 = 10\hat{l}$
 $\vec{v}_9 = 10(5\hat{i} + 4\hat{j})$, $\vec{v}_{10} = 10\hat{m}$
 $\vec{v}_{11} = 10(6\hat{i} + 5\hat{j})$, $\vec{v}_{12} = 10\hat{n}$
 $\vec{v}_{13} = 10(7\hat{i} + 6\hat{j})$, $\vec{v}_{14} = 10\hat{o}$
 $\vec{v}_{15} = 10(8\hat{i} + 7\hat{j})$, $\vec{v}_{16} = 10\hat{p}$
 $\vec{v}_{17} = 10(9\hat{i} + 8\hat{j})$, $\vec{v}_{18} = 10\hat{q}$
 $\vec{v}_{19} = 10(10\hat{i} + 9\hat{j})$, $\vec{v}_{20} = 10\hat{r}$

13 The weight of an average apple is
 $W = mg = 0.1 \text{ kg}(9.81 \text{ m/s}^2) = 0.981 \text{ N}$
 Mass in slugs is $m = \frac{W}{g} = \frac{0.981}{32.2} = 0.03047 \text{ slugs}$
 Mass in kg is $m = 0.1 \text{ kg}$
 Weight in N is $W = mg = 0.1(9.81) = 0.981 \text{ N}$
 These apples weigh about 2.2 N each. That's the rule of 2 N each!

14 Mass of steel sphere, $m = \rho V$
 $= (7830 \text{ kg/m}^3)(\frac{4}{3}\pi(0.050 \text{ m})^3) = 3.71 \text{ kg}$
 Force of steel attraction: $\frac{Gm^2}{r^2}$
 Weight of each sphere: $\frac{Gm^2}{r^2}$
 $\frac{Gm^2}{r^2} = \frac{Gm^2}{r^2}$, $r = 0.1 \text{ m}$
 $= 1.228 \times 10^{-10} \text{ N}$

15 $\vec{r}_A = \frac{1}{2}\hat{i} + \frac{1}{2}\hat{j}$, $r = 0.050 \text{ m}$ for all spheres
 $\vec{F}_A = \frac{Gm_1m_2}{r^2}\hat{r}_{12}$
 $\vec{F}_A = \frac{Gm^2}{r^2}\hat{r}_{12}$
 $= \frac{Gm^2}{r^2}(\frac{1}{2}\hat{i} + \frac{1}{2}\hat{j})$
 $= 4.31(10^{-10})\text{N}$
 $\vec{F}_B = \frac{Gm^2}{r^2}\hat{r}_{13}$
 $= \frac{Gm^2}{r^2}(\frac{1}{2}\hat{i} - \frac{1}{2}\hat{j})$
 $= 4.31(10^{-10})\text{N}$
 $\vec{F}_C = \frac{Gm^2}{r^2}\hat{r}_{14}$
 $= \frac{Gm^2}{r^2}(\frac{1}{2}\hat{i} + \frac{1}{2}\hat{j})$
 $= 4.31(10^{-10})\text{N}$
 $\vec{F}_D = \frac{Gm^2}{r^2}\hat{r}_{15}$
 $= \frac{Gm^2}{r^2}(\frac{1}{2}\hat{i} - \frac{1}{2}\hat{j})$
 $= 4.31(10^{-10})\text{N}$
 $\vec{F}_E = \frac{Gm^2}{r^2}\hat{r}_{16}$
 $= \frac{Gm^2}{r^2}(\frac{1}{2}\hat{i} + \frac{1}{2}\hat{j})$
 $= 4.31(10^{-10})\text{N}$
 $\vec{F}_F = \frac{Gm^2}{r^2}\hat{r}_{17}$
 $= \frac{Gm^2}{r^2}(\frac{1}{2}\hat{i} - \frac{1}{2}\hat{j})$
 $= 4.31(10^{-10})\text{N}$
 $\vec{F}_G = \frac{Gm^2}{r^2}\hat{r}_{18}$
 $= \frac{Gm^2}{r^2}(\frac{1}{2}\hat{i} + \frac{1}{2}\hat{j})$
 $= 4.31(10^{-10})\text{N}$
 $\vec{F}_H = \frac{Gm^2}{r^2}\hat{r}_{19}$
 $= \frac{Gm^2}{r^2}(\frac{1}{2}\hat{i} - \frac{1}{2}\hat{j})$
 $= 4.31(10^{-10})\text{N}$
 $\vec{F}_I = \frac{Gm^2}{r^2}\hat{r}_{20}$
 $= \frac{Gm^2}{r^2}(\frac{1}{2}\hat{i} + \frac{1}{2}\hat{j})$
 $= 4.31(10^{-10})\text{N}$

16 $\vec{v} = \frac{d\vec{r}}{dt} = \frac{d}{dt} [2t^2\hat{i} + 3t^3\hat{j} + 4t^4\hat{k}] = 4t\hat{i} + 9t^2\hat{j} + 16t^3\hat{k}$
 $v = \sqrt{16t^2 + 81t^4 + 256t^6}$
 $a = \frac{d\vec{v}}{dt} = 4\hat{i} + 18t\hat{j} + 48t^2\hat{k}$
 $a = \sqrt{16 + 324t^2 + 2304t^4}$
 $a = 4\sqrt{1 + 81t^2 + 144t^4}$
 $a = 4\sqrt{(1 + 9t^2)^2} = 4(1 + 9t^2)$
 $a = 4 + 36t^2$
 $a = 4 + 36(1) = 40 \text{ m/s}^2$
 Solve for t to obtain $t = 2.16 \text{ s}$

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