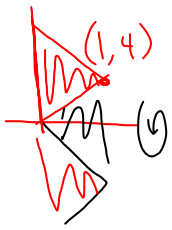
1. D

2. C $\int_0^8 \sqrt{2x} - (x-4)\,dx$

3. B $\pi \int_1^2 \left(\frac{1}{x}\right)^2 dx$

4. B 

$\pi \int_0^1 (-4x+8)^2 - (4x)^2\,dx$

5. E $\int_{16}^{25} \sqrt{1 + \left((y-1)^{\frac{1}{2}}\right)^2}\,dy$

$$\int_0^8 \left(\sqrt{2x}\right)^{\frac{1}{2}} - (x-4)\,dx$$

$$\left(\frac{2}{3}\frac{(2x)^{\frac{3}{2}}}{2} - \frac{x^2}{2} + 4x \right)\Bigg|_0^8$$

$$\frac{64}{3} - 32 + 32$$

1.

$v(0) = 3$ mph

$a(t) = 2.5t \frac{\text{mph}}{\text{sec.}}$

$v(t) = 3 + \int_0^t 2.5x \, dx$

$v(t) = 3 + \left(\frac{2.5x^2}{2}\right)_0^t$

$v(t) = 3 + \frac{2.5t^2}{2}$ mph

$s(7) = 0 + \int_0^{7\text{ sec.}} \left(3 + \frac{2.5t^2}{2}\right) dt$

$\left(3x + \frac{2.5x^3}{6}\Big|_0^7 \quad \frac{\text{m}}{\text{h}} \cdot \text{sec} \right) \frac{1\text{ h}}{3600\text{ sec.}}$

$\left(21 + \frac{2.5(7)^3}{6}\right) \frac{1}{3600}$ m

1.

$v(0) = 3$

$a(t) = 2.5t \frac{\text{mph}}{\text{sec.}}$

$v(t) = 3 + \int_0^t 2.5x \frac{\text{mph}}{\text{sec.}} dx$

$3 + \left(\frac{2.5x^2}{2}\Big|_0^t\right)$

$v(t) = 3 + \frac{2.5t^2}{2}$ mph

$s(7) = 0 + \int_0^7 3 + \frac{2.5t^2}{2} \, dt$

$3t + \frac{2.5t^3}{6}\Big|_0^7 \quad \frac{\text{m}}{\text{h}} \cdot \text{sec} \cdot \frac{1\text{ h}}{3600\text{ sec}}$

$\frac{\left(21 + \frac{2.5(7)^3}{6}\right)}{3600}$ m

9. 21,714 lbs. $F = kx$

3 in.

$21714 = k \cdot 3$

$k = 7238$

$W = \int F(x)$

$W = \int_0^{\frac{1}{2}} 7238x \, dx$

$W = \int_{\frac{1}{2}}^{1} 7238x \, dx$

3. $\int_0^3 x\sqrt{9-x^2}\, dx$

$u = 9 - x^2$

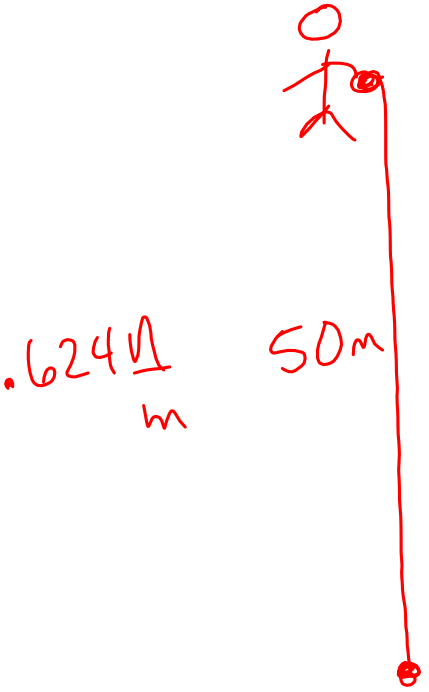
$du = -2x\, dx$

$\frac{du}{-2x}$

$\int x \, u^{\frac{1}{2}} \frac{du}{-2x}$

$-\frac{1}{2}\int_9^0 u^{\frac{1}{2}} du = \frac{1}{2}\int_0^9 u^{\frac{1}{2}} du$

11



$$\int_0^{50} .624(50-x)\,dx$$

9.

$$F = Kx$$

$$21,714 = K \cdot 3$$

$$K = 7238$$

$$W = \int_0^{\frac{1}{2}} 7238x\,dx$$

$$W = \int_{\frac{1}{2}}^{1} 7238x\,dx$$

17a.

10b.

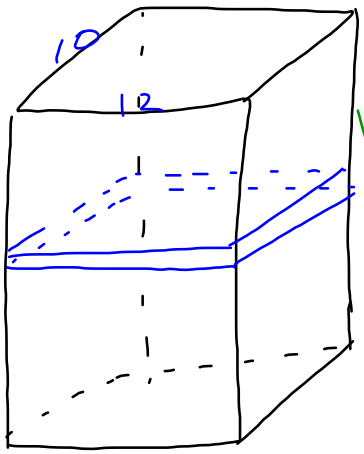
$$150 = K \cdot \frac{1}{16}$$

$$K = 2400$$

$$F = 2400x$$

$$W = \int_0^{\frac{1}{8}} 2400x \, dx$$

17a.



Weight: density · V

$62.4(10 \cdot 12)\,dy$

$$W = \int_0^{20} \underbrace{62.4(10 \cdot 12)\, y}_{f = w \cdot y} \, dy$$

$$= 1,497,600 \text{ ft.-lb.}$$

$.624 \frac{N}{m}$

$\int .624(50-x)$

$\frac{N}{m} \cdot m$

$W = \int f(x)$