



9.

$$a(t) = 1 + 3\sqrt{t} \quad \frac{\text{mph}}{\text{sec}}$$

$$v(t) = \underline{0} + \int_0^t 1 + 3\sqrt{x} \, dx$$

$$v(9) = 0 + \int_0^9 1 + 3\sqrt{x} \, dx \quad \frac{\text{mph}}{\text{sec}}$$

$$x + \frac{2}{3}x^{\frac{3}{2}} \Big|_0^9$$

$$v(9) = 0 + \left( x + 2x^{\frac{3}{2}} \right) \Big|_0^9 \quad \frac{\text{mph} \cdot \text{sec}}{\text{sec}}$$

$$9 + 2(27)$$

$$= 63 \text{ mph}$$

b.

$$v(t) = 0 + \int_0^t 1 + 3x^{\frac{2}{3}} \, dx$$

$$v(t) = 0 + \left( x + 2x^{\frac{5}{3}} \right) \Big|_0^t$$

$$v(t) = t + 2t^{\frac{5}{3}}$$

$$s(9) = 0 + \int_0^9 t + 2t^{\frac{5}{3}} \, dt \quad \text{mph}$$

$$\frac{t^2}{2} + \frac{2 \cdot 3}{5} t^{\frac{8}{3}} \Big|_0^9$$

$$\frac{t^2}{2} + \frac{12}{5} t^{\frac{8}{3}} \Big|_0^9 \quad \text{mph} \cdot \text{sec}$$

$$\frac{81}{2} + \frac{12}{5}(243) - (0)$$

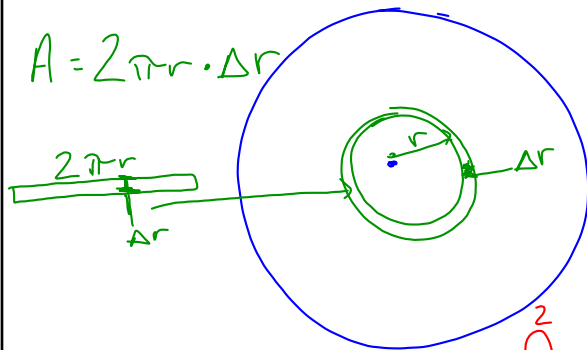
$$\left( \frac{81}{2} + \frac{972}{5} \right) \frac{\text{m}}{\text{sec}} \cdot \frac{1 \text{ hr}}{3600 \text{ sec}}$$

$$.06525 \text{ m}$$

23.

$$P_d = 10,000(2-r) \rightarrow 0$$

$$A = 2\pi r \cdot \Delta r$$

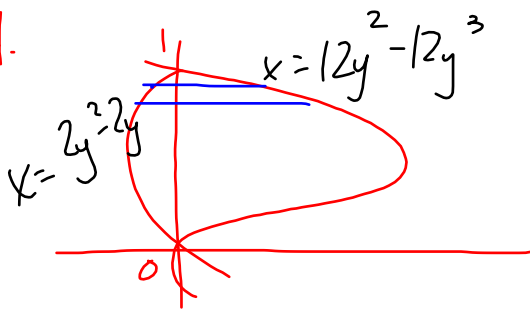
a.  $r \rightarrow 2$ 

$$P = P_d \cdot \text{area}$$

$$\int_0^2 10,000(2-r) 2\pi r dr$$

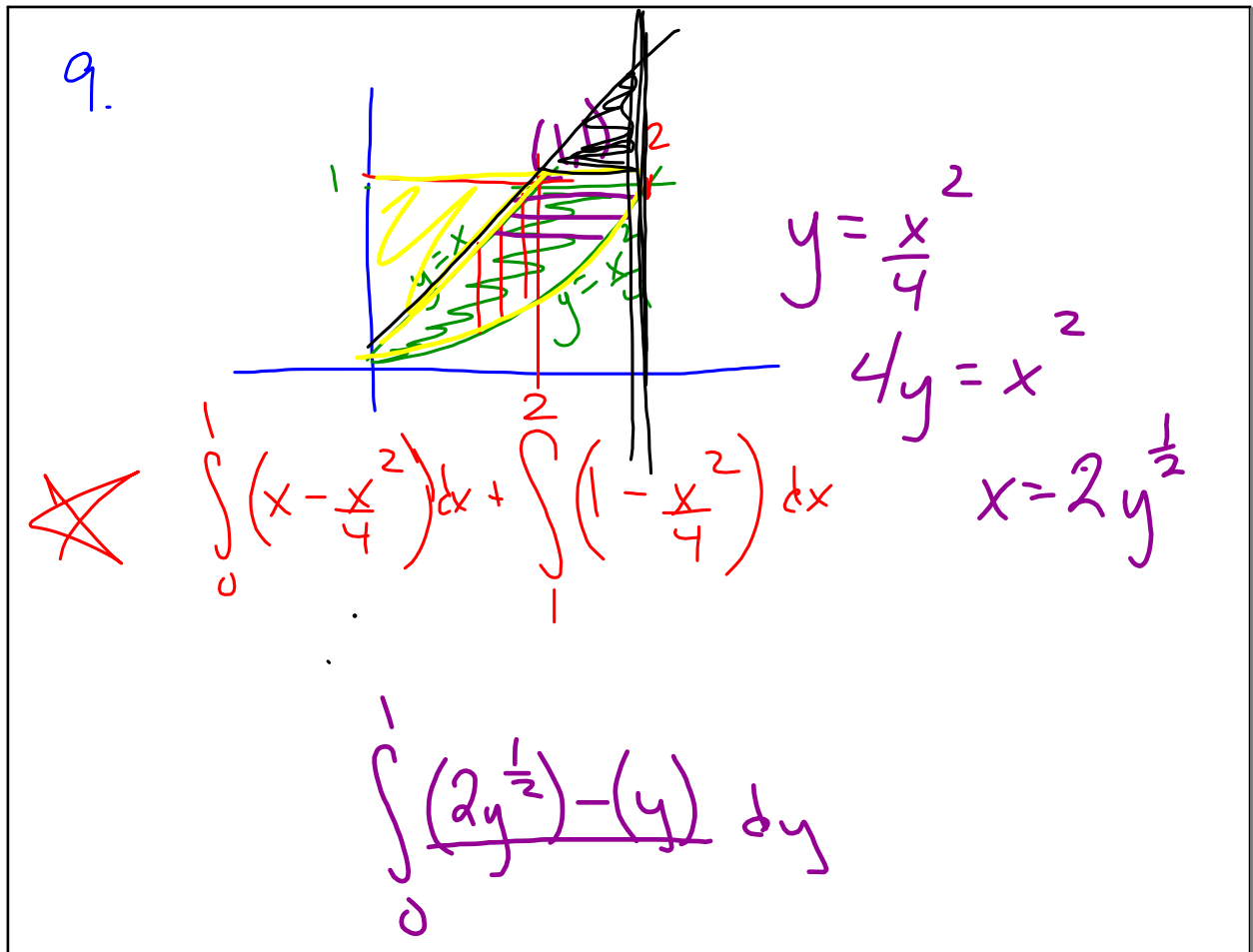
$$20,000\pi \int_0^2 (2r - r^2) dr$$

4.



$$\int_0^1 (12y^2 - 12y^3) - (2y^2 - 2y) dy$$

$$\int_0^1 (10y^2 - 12y^3 + 2y) dy$$



23.

$$y^2 - 4x = 4 \quad 4x - y = 16$$

$$y^2 - 4 = 4x \quad x = \frac{16 + y}{4}$$

$$x = \frac{y^2}{4} - 1 \quad x = 4 + \frac{y}{4}$$

$$\int_{-4}^5 (4 + \frac{y}{4}) - (\frac{y^2}{4} - 1) dy$$

$$\frac{y^2}{4} - 1 = 4 + \frac{y}{4}$$

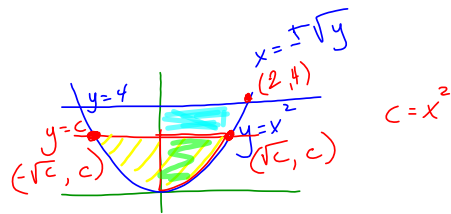
$$\frac{y^2}{4} - \frac{y}{4} - 5 = 0$$

$$y^2 - y - 20 = 0$$

$$(y + 4)(y - 5) = 0$$

$$y = -4, 5$$

4).



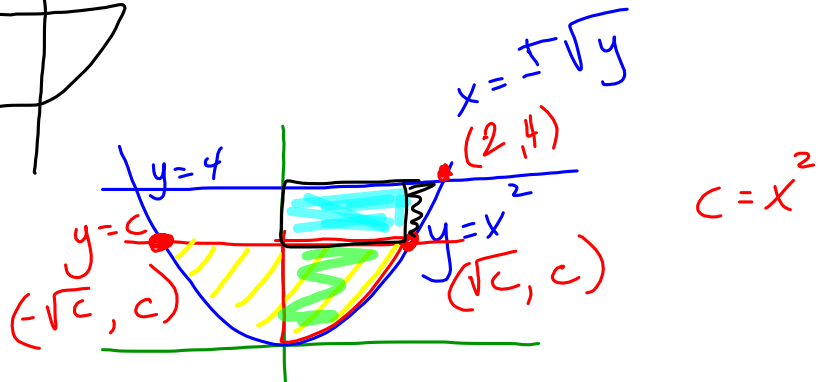
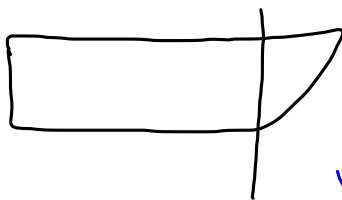
$$\int_0^c \sqrt{y} \, dy = \int_c^4 \sqrt{y} \, dy$$

$$\frac{2}{3} y^{\frac{3}{2}} \Big|_0^c = \frac{2}{3} y^{\frac{3}{2}} \Big|_c^4$$

$$\frac{2}{3} c^{\frac{3}{2}} = \frac{2}{3} (8) - \frac{2}{3} c^{\frac{3}{2}}$$

$$\cancel{\frac{2}{3}} c^{\frac{3}{2}} = \frac{16}{3} \cdot \cancel{\frac{3}{4}}$$

$$(c)^{\frac{3}{2}} = (4)^{\frac{3}{2}} = (2^2)^{\frac{3}{2}} = 2^{\frac{4}{2}}$$



$$\int_0^c 4 - x^2 \, dx = (4 - c)(\sqrt{c}) + \int_{\sqrt{c}}^2 4 - x^2 \, dx$$