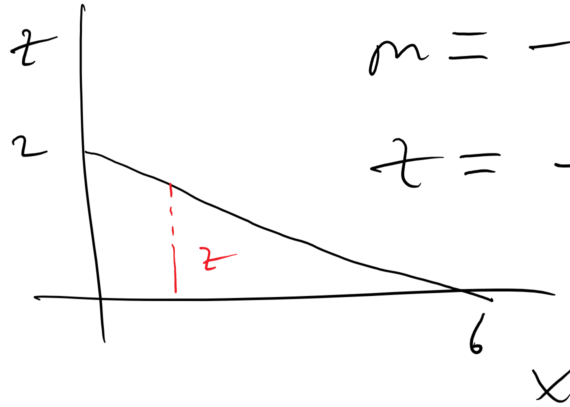
4A



$m = -1/3$

$z = -\frac{1}{3}x + 2$

area of $= \left(-\frac{1}{3}x + 2\right) \cdot 4$

$$\int_0^6 \left(-\frac{1}{3}x + 2\right) \cdot 4 \, dx$$

$$4\left(-\frac{1}{6}x^2 + 2x\right)\Big|_0^6$$

$$4\left(-\frac{1}{6} \cdot 6^2 + 2(6) - 0\right)$$

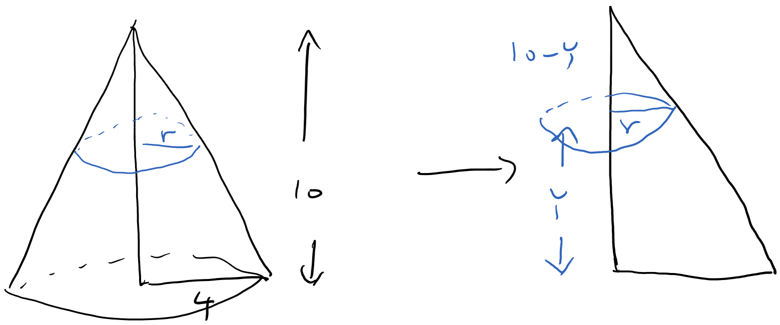
$$= 4(-6 + 12) = 24$$

4.13

Area = 6

$$\int_0^4 6\,dy = 6y\Big|_0^4 = 24$$

2



$r(y)$

$$\frac{10}{4} = \frac{10-y}{r}$$

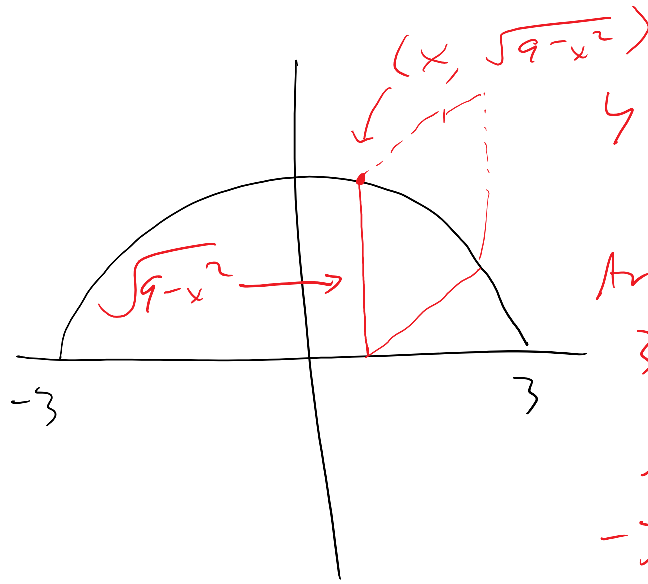
$10r = 40 - 4y$

$r = 4 - 0.4y$

Area of cross-section $= \pi(4-0.4y)^2$

$$\pi \int_0^{10} (4-0.4y)^2 \, dy$$

11



$y = \sqrt{9-x^2}$

Area of $\square = 9 - x^2$

$$\int_{-3}^{3} 9 - x^2 \, dx$$

$$9x - \frac{1}{3}x^3 \Big|_{-3}^{3} = 27 - 9 - (-27 - -9)$$

$$18 - (-18) = 36$$

390: 12, 13, 14

a) $H'(6) \approx \frac{H(7)-H(5)}{2} = \frac{11-6}{2} = \frac{5}{2}\ \frac{m}{yr}$

The tree grows at ~2.5 m/yr when $t=6$.

b) $\frac{H(5)-H(3)}{2} = \frac{6-2}{2} = 2$

Mean Value Theorem: must be a tangent line parallel to a secant line

d) $G(x) = \frac{100x}{1+x}$

$H = 50$

$\frac{dx}{dt} = 0.03\ \frac{m}{yr}$

$$\frac{dG}{dt} = \frac{dG}{dx} \cdot \frac{dx}{dt}$$

$$\frac{dG}{dx} = \frac{(1+x)(100) - 100x(1)}{(1+x)^2} = \frac{100}{(1+x)^2} = 25$$

$50 = \frac{100x}{1+x} \rightarrow 50 + 50x = 100x$

$50 = 50x \quad x = 1$

$$\frac{dG}{dt} = 25(0.03) = 0.75\ \frac{m}{yr}$$

$$\frac{db}{dt} = 25\,(0{,}03) = 0{,}75\ \frac{m}{yr}$$