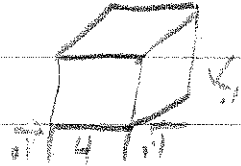


(17) a) $p=2$ $dp=.1$ b) $p=6$ $dp=.15$
 $dD = (-9p^2 - 4p) dp$ $dD = (-9(36) - 24)(.15)$
 $= (-36 - 8)(.1)$ $dD = -52.2$
 $dD = -4.4$ $dD = -52.2$

(21) $V = x^3$ $x=4$ $dx = .2$
 $dV = 3x^2 dx$



$= 3(16)(.2)$
 $dV = 9.6 \cdot 1000 \approx 9600 \text{ in}^3$

(28) $A = \pi r^2$ $r=1.2$ $dr = .2$

$dA = 2\pi r dr$

$dA = 2\pi(1.2)(.2) \approx 4.8\pi \approx 15.08 \text{ miles}^2$

(30) a) $0 < p < 94.359$

b) $p=60$ $dp=5$

$dA = \frac{1.181(94.359 - p) - 1.181p(-1)}{(94.359 - p)^2} \cdot dp$

$dA \approx \left[\frac{1.181(34.359) + 1.181(60)}{(34.359)^2} \right] \cdot 5 \approx .472$

(33) $V = \frac{4}{3}\pi r^3$ $r=3 \text{ cm}$ $dr = .2$

$dV = 4\pi r^2 dr$

$dV = 4\pi(9)(.2)$

$dV \approx -7.2\pi \approx -22.62 \text{ cm}^3$

$$(38) A = \pi r^2 \quad r = 4.87'' \quad dr = \pm .04''$$

$$dA = 2\pi r dr$$

$$dA = 2\pi(4.87)(\pm .04)$$

$$dA = \pm 1.224 \text{ in}^2$$

$$(40) V = 125 \text{ ft}^3 \quad dV = \pm 3 \text{ ft}^3 \quad dx = ?$$

$$V = x^3$$

$$125 = x^3$$

$$5 = x$$

$$dV = 3x^2 dx$$

$$\frac{\pm 3}{3(5^2)} = dx \Rightarrow \pm .004 \text{ ft} = dx$$