

5.22

$$a) A'(r) = 100,000 \left(1 + \frac{r}{12}\right)^{119}$$

$$dA = 100,000 \left(1 + \frac{r}{12}\right)^{119} dr$$

↓

3.3.34.

$$p = s(r) = 0.19430$$

$$p = 789.58.0130.79$$

3.3.28.

a)

$$0 \quad 2$$

$$1 \quad 1.4444$$

$$2 \quad 1.13057$$

$$x_4 = 1.00022$$

$$b) |x_4 - 1| = |1.00022 - 1|$$

$$= 0.00022$$

5.324

$$a) \quad k \quad x_n$$

$$0 \quad 1.5$$

$$1 \quad 1.5 - \frac{1.5^2 - 3}{2(1.5)} = 1.75$$

$$2 \quad 1.75 - \frac{1.75^2 - 3}{2(1.75)} = 1.73214$$

$$\therefore \sqrt{3} = 1.73205$$

$$b) \quad n \quad x_n$$

$$0 \quad 2.5$$

$$1 \quad 2.5 - \frac{2.5^2 - 7}{2(2.5)} = 2.65$$

$$2 \quad 2.65 - \frac{2.65^2 - 7}{2(2.65)} = 2.64575$$

$$\therefore \sqrt{7} = 2.64578$$

c) $\sqrt{14}$

$$0 \quad 2.5$$

$$1 \quad 2.5 - \frac{2.5^2 - 14}{3(2.5)^2} = 2.433$$

$$\sqrt[3]{14} = 2.4101$$

5.3.9

a) $\sqrt{49.5}$

$$df = \frac{1}{2\sqrt{49}} (0.5)$$

$$= \frac{1}{28}$$

$$\Delta f = f(49.5) - f(49)$$

$$= \sqrt{49.5} - 7$$

$$= \frac{1}{28}$$

$$f(49.5) = \frac{1}{28} + 7 = \frac{197}{28}$$

b) $\sqrt[3]{8.2}$

$$df = \frac{1}{3x^2} (0.2)$$

$$= \frac{1}{60}$$

$$\Delta f = f(8.2) - f(8) = \frac{1}{60}$$

$$f(8.2) = \frac{1}{60} + 2$$

$$= \frac{121}{60}$$

c) $\sqrt{4.05} + \frac{1}{\sqrt{4.05}}$

$$df = f'(x) dx$$

$$= \left(\frac{1}{2\sqrt{x}} - \frac{1}{2x^{3/2}} \right) dx$$

$$\Delta f = f(4.05) - f(4)$$

$$= \left(\frac{1}{4} - \frac{1}{16} \right) (0.05) + \left(2 + \frac{1}{2} \right)$$

$$= \frac{3}{16} (0.05) + \frac{5}{2}$$

$$= 2.509375$$

5.13

$$dN = \frac{-8(0.04)}{(1+0.02r)^2} dr$$

$$r=0.1$$

$$dN = -0.000139$$

5.15

$$x=12 \quad V=x^3$$

$$|dV| \leq |V'(x)| |dx| \leq |3(12)^2| |0.02| \leq 8.64 \text{ cm}^3$$

5.19

$$dp = f'(q) dq = \frac{100q}{(3q^2+2)^2} dq$$

$$\frac{dp}{q} = \left(-\frac{100q}{(3q^2+2)^2} dq \right) \left(\frac{3q^2+2}{25} \right) = -\frac{6q}{3q^2+2} dq$$

$$\left| \frac{dp}{q} \right| = \frac{6q}{3q^2+2} \left| \frac{dq}{q} \right|$$

$$\left| \frac{dp}{q} \right| \leq \frac{6(4)}{3(4)+2} |0.1| \leq 0.18$$