

$$1) \quad x = \sqrt{7 + \sqrt{7 + \sqrt{7} \dots}} \quad \text{--- (1)}$$

$$x^2 = 7 + \sqrt{7 + \sqrt{7 + \sqrt{7} \dots}} \quad \text{[substituting equation 1]}$$

$$x^2 - 7 = x$$

$$x^2 - x - 7 = 0$$

$$x = \frac{1 \pm \sqrt{1 + 28}}{2}$$

$$x = 3.19 \quad \text{---}$$

$$2) \quad 7x^2 - 6y^2 = -11x^2 - 4y^2$$

$$18x^2 = 2y^2$$

$$\frac{x^2}{y^2} = \frac{1}{9}$$

$$\frac{x}{y} = \frac{1}{3}$$

$$3) \quad x + 3y = 4$$

$$x = 4 - 3y \quad \text{--- (1)}$$

$$x^2 + y^2 - 4y = 12 \quad \text{[Substituting equation 1]}$$

$$y^2 - 24y + 16 + y^2 - 4y - 12 = 0$$

$$10y^2 - 28y + 4 = 0$$

$$y = \frac{28 \pm \sqrt{624}}{20}$$

$$y = 2.649 \text{ OR } 0.151$$

$$x + 3y = 4$$

$$x + 3 \times 2.649 = 4$$

$$x = -3.947$$

$$x + 3 \times 0.151 = 4$$

$$x = 3.547$$

$$u) d = 2x^2 - 16x + 34$$

$$d = 2(3.5)^2 - 16(3.5) + 34$$

$$d = 2.5$$

$$b) d = 2x^2 - 16x + 34$$

$$d' = 4x - 16$$

$$0 = 4x - 16$$

$$x = 4$$

$$c) 100 = 2x^2 - 16x + 34$$

$$0 = 2x^2 - 16x - 66$$

$$x = \frac{16 \pm \sqrt{16^2 + 4 \cdot 2 \cdot 66}}{2 \cdot 2}$$

$$x = 2x^2 - 16x - 66$$

$$0 = 2x(x - 11) + 6(x - 11)$$

$$x = 11$$

$$5) a) C = 1500 + 25x$$

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$$b) C = 2100 + 22x$$

$$c) 1500 + 25x > 2100 + 22x$$

$$d) 1500 + 25x > 2100 + 22x$$

$$3x > 600$$

$$x > 200$$

$$6a) \text{ For } x=0$$

$$y = -6$$

$$\text{For } x=1$$

$$y = 2$$

$$\text{For } x=0.5$$

$$y = -5/8$$

$$\text{For } x=0.75$$

$$y = 63/64$$

for

$$\text{For } x=0.125$$

$$y = 133/512$$

$$\text{For } x=0.625$$

$$y = -0.162$$

$$\text{for } x=0.894$$

$$y = 0.054$$

$$x = 0.578$$

$$y = -0.052$$

$$x = 0.58$$

$$b) \text{ for } x=1 =$$

$$y = 2$$

$$\text{for } x=3.2$$

$$y = 8 - \frac{14}{125}$$

$$\text{for } x=2.1$$

$$y = 1.791$$

$$\text{for } x=2.925$$

$$y = 0.8582$$

$$\text{for } x=3.0625$$

$$y = 5.0544$$

$$\text{for } x=2.99$$

$$y = 0.066$$

$$\text{for } x=3.028$$

$$y = -0.0265$$

$$y = 3.00$$

c)	a	b	t	f(t)
	3.2	6	3.6	0.0336
	3.2	3.6	3.4	-0.016
	3.4	3.6	3.5	0.175
	3.4	3.5	3.45	0.0461
	3.4	3.45	3.425	0.013
	3.4	3.425	3.425	-0.002
	3.4125	3.425	3.42	0.005

Q7 $f'(x) = 920x^3 + 64x^2 + 18x - 24$

$$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$$

a) $x_1 = 1$

$$x_2 = 0.96850$$

$$x_3 = 0.9624$$

$$x_4 = 0.9624$$

b) $x_1 = -1$

$$x_2 = -0.6081$$

$$x_3 = -0.2354$$

$$x_4 = -0.4786$$

$$x_5 = -0.0407$$

$$x_6 = -0.0407$$

$$x_7 = -0.407$$

8a) $\frac{70 + 86 + 81 + 83 + x}{5}$

$$= \frac{320 + x}{5}$$

b) $80 \leq \frac{320 + x}{5} < 90$

c) $80 \leq x \leq 130$

$$86 \leq x \leq 100$$

9) $\frac{8.54}{(8.54 + 11.81)} \times (20 - 4) + 4$
 $= 10.7\%$

10) For profit $0 < 20x - 0.21x^2 - 195$

$$-by \sqrt{b^2 - 4ac}$$

$$= \frac{-20 \pm \sqrt{400 - 163.8}}{2 \times -0.21}$$

$$= 11 < x \leq 84$$