Question 1

(a) $\boldsymbol{C + 4P = 1,200}$. The MRS must be equal to the slope of the budget line, i.e., $\boldsymbol{-P^2/C^2 = -1/4}$. Therefore $4P^2 = C^2$, i.e., $2P = C$. Thus, $\boldsymbol{C = 400}$ and $\boldsymbol{P = 200}$.

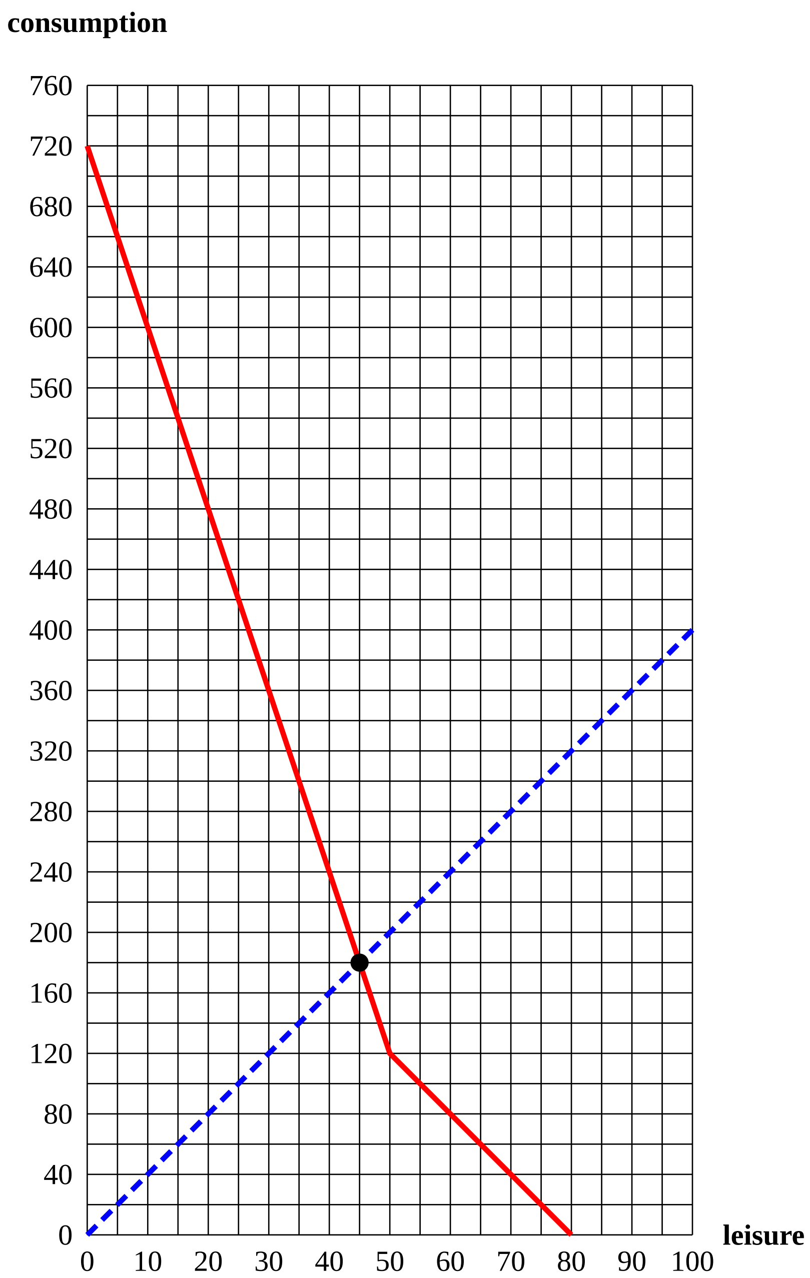
(b) $\boldsymbol{C + 9P = 2,700}$. The MRS must be equal to the slope of the budget line, i.e., $\boldsymbol{-P^2/C^2 = -1/9}$. Therefore $9P^2 = C^2$, i.e., $3P = C$. Thus, $P = 225$. Her consumption therefore **increases by 25 units**.

Question 2

(a) The budget line equation is $\boldsymbol{4R + c = 320}$. Since $4R = c$, it follows that $R = 40$. Therefore she **works 40 hours**.

(b) The budget line equation is $\boldsymbol{8R + c = 640}$. Since $4R = c$, it follows that $R = 53.33$. Therefore she **works 27.67 hours**.

(c)



(d) Mary will therefore work 35 hours.

Question 3

- **(a)** The equation of the budget line is $\mathbf{1.15c_1 + c_2 = 21,850}$ At the optimal choice $\mathbf{-c_2/(0.9c_1) = -1.15}$. Thus, $c_2 = 1.035c_1$. Inserting this in the budget line equation yields $c_1 = 10,000$ and $c_2 = 10,350$.
- **(b)** He will borrow 8000 Dollars.
- **(c)** The answer will change. He will borrow 1,000 Dollars.

Question 4 **(a)** The expected utility without the lock is $\mathbf{0.1\sqrt{600} + 0.9\sqrt{1,000} = 30.90999}$ The expected utility with the lock is $\mathbf{0.04\sqrt{570} + 0.96\sqrt{970} = 30.85401}$ Therefore he will not purchase the lock.

- **(b)** Let p be the probability. Then the expected utility with the lock is $\mathbf{p\sqrt{570} + (1-p)\sqrt{970} = 30.90999 = 0.1\sqrt{600} + 0.9\sqrt{1,000}}$ Therefore $\mathbf{p = 0.0323}$, which is about $\mathbf{1/31}$.
- **(c)** Without insurance, expected utility is again $\mathbf{0.1\sqrt{600} + 0.9\sqrt{1,000} = 30.90999}$ With the insurance, it is $\mathbf{\sqrt{950} = 30.822}$. Therefore you should not purchase the insurance
- **(d)** Without the lock expected utility is $\mathbf{0.1\sqrt{950} + 0.9\sqrt{990} = 31.400}$ With the lock expected utility is $\mathbf{0.04\sqrt{946} + 0.96\sqrt{986} = 31.374}$. Therefore you should not get the lock.

Question 5 If he buys y shares then $\mathbf{c_u = 10,000 + 2y}$ and $\mathbf{c_d = 10,000 - y}$. Therefore $c_u + 2c_d = 30,000$, which implies $\mathbf{\frac{1}{3}c_u + \frac{2}{3}c_d = 10,000}$.

The value of the option is $\frac{1}{3}(3) + \frac{2}{3}(0)$, i.e., 1 Dollar.

Question 6 The income offer curve is given by $x_2/x_1 = 1/2$, i.e., $x_1 = 2x_2$. The utility of $(20, 90)$ is $u(20, 90) = 1,800$. Thus, $x_1x_2 = 1,800$. Solving the two equations for x_1 and x_2 yields $x_1 = 60$, $x_2 = 30$. The cost of this consumption is 120. $\boxed{\textbf{The person needs } \mathbf{m = 120.}}$