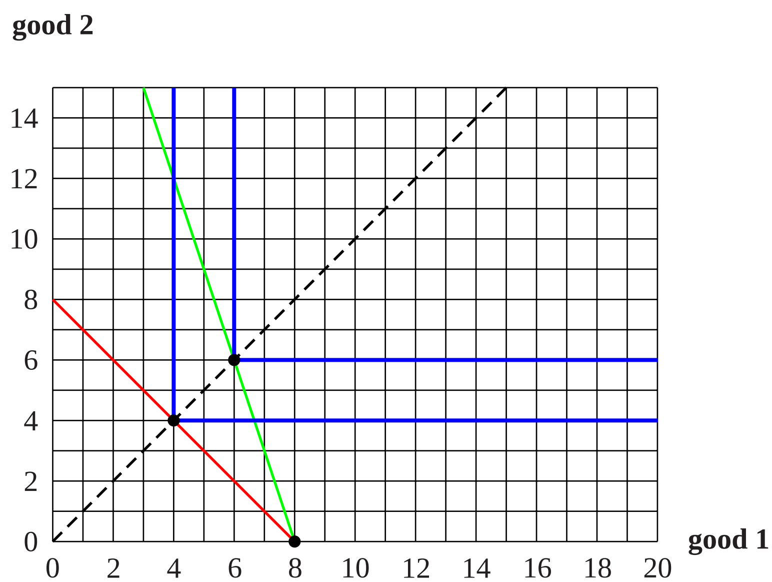
Question 1 Because good 2 is less expensive, $x_1 = 0$. The value of his endowment is $24 + 10 = 34$. Because $p_2 = 1$,

He consumes 34 units of good 2

Question 2 $\boldsymbol{e = (8, 0)}$.



Question 3 Note that $\text{MRS} = -\frac{x_2}{2x_1} = -\frac{p_2}{p_2} = -2$. therefore, $x_2 = 4x_1$. Since $x_1 = 20$,

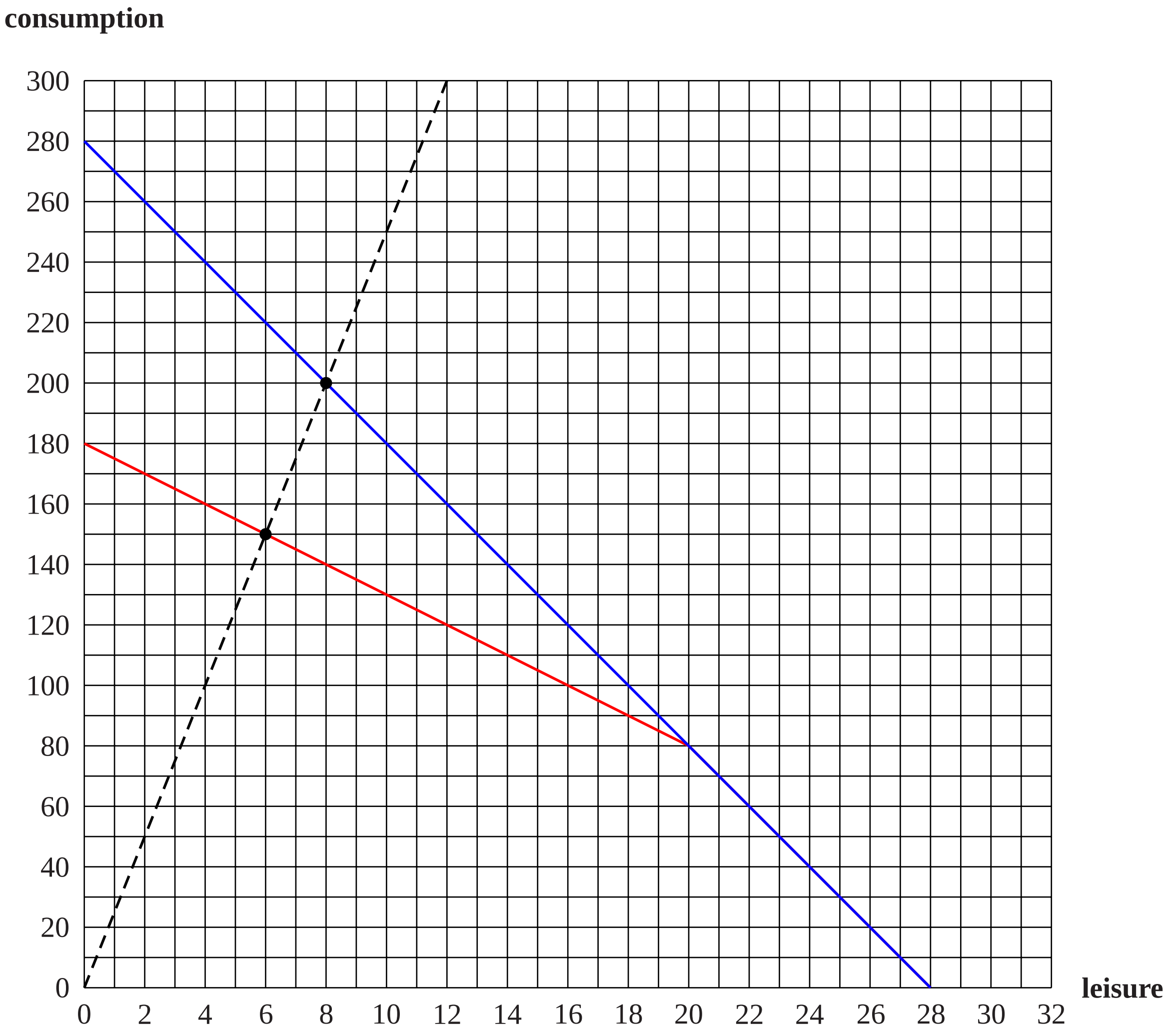
Mary's endowment of good 2 is 80

Question 4 $-\frac{c^2}{R^2} = -16$ implies $\frac{c}{R} = 4$. Therefore, $c = 4R$. His budget line equation is $16R + c = 1,280 + 100$. Therefore, $R = 69$.

Joe will work 11 hours per week.

Question 5 **Alice will work 22 hours per week.**

If the tax is eliminated then Alice will work 20 hours per week.



Question 6

(a) At the optimal choice $-\frac{x_2}{0.9x_1} = -(1+r) = -1.1$, which implies $x_2 = 0.99x_1$. The budget line equation is $1.1x_1 + x_2 = 44,000 + 40,227 = 84,227$. Therefore,

$$\boxed{\textbf{George will spend \$40,300 this year.}}$$

(b) At the optimal choice $-\frac{x_2}{0.9x_1} = -(1+r) = -1.2$, which implies $x_2 = 1.08x_1$. The budget line equation is $1.2x_1 + x_2 = 50,400 + 43,080 = 93,480$. Therefore, $x_1 = 41,000$.

$$\boxed{\textbf{George will spend \$41,000 this year.}}$$

10 points

Question 7 $c_g = 1.6y + (1,750 - y)0.9 = 0.7y + 1,575$ and $c_b = 0.6y + (1,750 - y)1.1 = 1,925 - 0.5y$. Eliminating y, these equations can be combined to the budget line equation $5c_g + 7c_b = 21,350$. Expected utility is given by

$u(c_g, c_b) = 0.4\ln(c_g) + 0.6\ln(c_b)$. Therefore, MRS $= -\frac{0.4c_b}{0.6c_g}$. At the optimal choice, $-\frac{0.4c_b}{0.6c_g} = \frac{5}{7}$. Therefore, $28c_b = 30c_g$. This, and the budget line equation yields, $c_g = 1,708$ and $c_b = 1,830$. Using $c_g = 0.7y + 1,575$ or $c_b = 1,925 - 0.5y$ we can now determine y. Therefore,

Susan will invest \$190 in fund A.

Susan will invest \$1,560 in fund B.

Question 8 Nick's expected utility is $0.2(-1) + 0.1\left(-\frac{1}{4}\right) + 0.7(-10)$. Therefore,

Nick's expected utility from playing the lottery is -7.225

The maximum he should pay is the certainty equivalent, i.e., we must find the value x at which $-\frac{100}{x} = -7.225$. Thus, $7.225x = 100$, which implies

Nick should pay at most \$13.84 to play the lottery.

Question 9 We must have $\sqrt{10,000} = (1/3)\sqrt{3,600} + (2/3)\sqrt{y + 10,000}$. Therefore,

$100 = 20 + (2/3)\sqrt{10,000 + y}$. Therefore $\boxed{y = 4,400}$