Math I Assignment 1

Q1 Evaluate $f(x) = 4 - 3x$ with $\frac{f(3+h) - f(3)}{h}$

Q2 Find domain and range of the functions.
i) $h(x) = \sqrt{4 - x^2}$ ii) $g(x) = \frac{2x+1}{x-3}$

Q3 Determine whether the following fns are even or odd.
i. $f(x) = \frac{x^2}{x^4+1}$ ii) $g(x) = x|x|$ iii) $f(x) = 2|x|+1$ iv) $g(x) = 3$

Q4 An electricity company charges a base rate of Rs 100 a month plus Rs 5 per kwh (unit) for the first 1200 kwh and Rs 7 per kwh for all usage over 1200 kwh. Express the monthly cost, E, as function of electricity used.

Q5. If it costs Rs 3800 to drive 480 kms and Rs 4600 to drive 800 kms in another month.
(a) Express monthly cost C as fn of the distance driven d, assuming that a linear relation holds.
(b) Use equation from (a) to predict cost to drive 500 kms.
(c) Draw the graph of the linear fn and interpret the slope.
(d) What does the intercept represent?

Q6 Find fog, gof, fof, gog and state their domains.
i) $f(x) = x^2 - 1$; $g(x) = 2x + 1$ ii) $f(x) = x^2$, $g(x) = 1 - \sqrt{x}$

Q7 Express the fn in the form of fog if.
i) $f(x) = (2x + x^2)^4$ ii) $f(x) = \cos^4 x$ iii) $U(t) = \frac{\tan t}{1 + \tan t}$

Q8 Express the fn in the form of fofofoh if.
i) $R(x) = \sqrt{\sqrt{x} - 1}$ ii) $H(x) = \sqrt[8]{2 + |x|}$

Q9 Find the new fn by using given transformation
i) $y = \sqrt{x+1}$ compressed horizontally by factor 4.
ii) $f(x) = x^3 - 4x^2 - 10$ compress vertically by 2 followed by reflection about X-axis.

Q10 Find the appropriate transformation used in the following
i) $y = |x| - 2$ ii) $y = x^2 + 2$, iii) $y = \sqrt{x-2} - 1$
iv) $y = (x-1)^3$

Q11 Find the formula for inverse of the fns
i) $f(x) = 1 + \sqrt{2 + 3x}$ ii) $y = \frac{e^x}{1 + 2e^x}$