Assignment 03

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Selected exercises chapter 3 of Pure Mathematics 1 by Hugh Neil and Douglas Qualing.

1.Find the largest possible domain of each of the following functions:

a) $\dfrac{1}{1+\sqrt{x}}$

b) $\dfrac{1}{(x-1)(x-2)}$

2. The domain of these functions is the set of all positive real numbers. Find their ranges:

a) $f(x) = -5x$

b) $f(x) = 3x - 1$

c) $f(x) = (x-1)^2 + 2$

3. For what values of x are these inequalities satisfied?

a)$x^{-4} \geq 100$

b)$8x^{-4} < 0.00005$.

4. Given that k is a positive constant, sketch the graphs of:

a) $y = (x + 4k)(x + 2k)$.
b) $y = x(x - k)(x - 5k)$.

5. Show that the curves $y = 2x^2 + 5x$, $y = x^2 + 4x + 12$ and $y = 3x^2 + 4x - 6$ have one point in common and find its coordinates.

6. Given that the curves $y = x^2 - 3x + c$ and $y = k - x - x^2$ meet at the point $(-2, 12)$, find the values of c and k. Hence find the other point where the two curves meet.

7. The straight line $y = x - 1$ meets the curve $y = x^2 - 5x - 8$ at the points A and B. The curve $y = p + qx - 2x^2$ also passes through he points A and B. Find the values of p and q.

8. The line $y = 10x - 9$ meets the curve $y = x^2$. Find the coordinates of the points of intersection.