

KING FAHD UNIVERSITY OF PETROLUUM AND MINERALS
College of Science, Prep- Year Math Program
Math 001 - Term 071

PART I - MCQ

Q1) The graph of $p(x) = x^2(x+2)^2 - (x+2)^2$ is below the x -axis on the interval:

- a) $(-2,1)$ b) $(-1,1)$ c) $(-2,-1)$ d) $(0,1)$ e) $(-2,0)$

Q2) The Polynomial $p(x) = x^3 - 4x - 4$ has a zero between:

- a) -1 and 0 b) 0 and 1 c) 3 and 4 d) -3 and -2 e) 2 and 3

Q3) The sum of all non-integer rational zeros of the polynomial $p(x) = 4x^4 + 4x^3 + 23x^2 - x - 6$

- a) 0 b) 1 c) -1 d) $\frac{5}{2}$ e) $-\frac{3}{2}$

Q4) The polynomial $p(x)$ of lowest degree with real coefficients that has zeros i (multiplicity 2), and 3 is

- a) $p(x) = x^5 - 3x^4 + 2x^3 - 6x^2 + x - 3$
b) $p(x) = x^5 - 3x^4 + 2x^3 - 6x^2 - x - 3$
c) $p(x) = x^5 - 3x^4 - 2x^3 + 6x^2 + x - 3$
d) $p(x) = x^5 + 3x^4 + 2x^3 - 6x^2 - x - 3$
e) $p(x) = x^5 + 3x^4 + 2x^3 + 6x^2 + x - 3$

Q5) If -1 is a zero of multiplicity 2 of $p(x) = x^3 + Ax + B$ then $A + B =$

- a) 0 b) 2 c) 4 d) -5 e) -2

Q6) If $(x-i)$ is a factor of $P(x) = x^4 - 2x^3 + 2x^2 - 2x + 1$, then the NUMBER of x -intercepts of $p(x)$ is

- a) 0 b) 2 c) 3 d) 1 e) 4

Q7) If $f^{-1}(x) = 2 + \sqrt{x-1}$, $x \in [1, \infty)$, then $f(4)$ is equal to:

- a) 6 b) 4 c) 5 d) 8 e) 9

Q8) The largest negative integer that is a **lower bound** for the real zeros of $f(x) = x^5 + 7x^2 - x + 3$ is:

- a) -1 b) -5 c) -4 d) -2 e) -3

PART I I – WRITTEN

Q1) Given the function $f(x) = -x^2 + 4x$, $x \leq 2$.

a) Find $f^{-1}(x)$.

b) State the **domain** and **range** of $f^{-1}(x)$

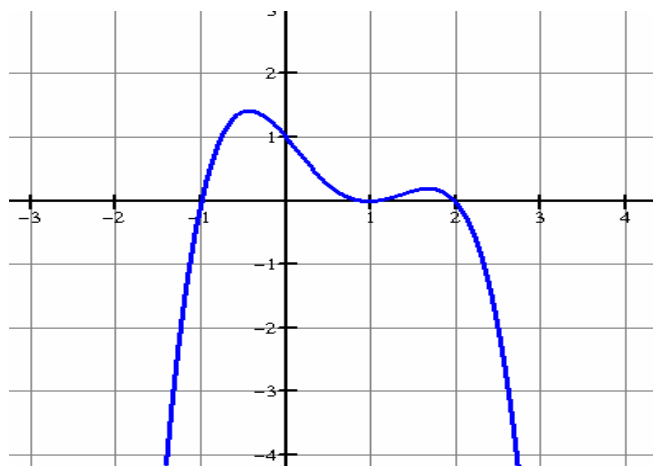
Q2) The far left and far right behavior of the graph of the polynomial

$$P(x) = -2x(x+3)(x-1)^2(2-x)^3$$

Q3) What is the number of negative real zeros of the polynomial $P(x) = 2x^5 - x^2 - 3x + 5$

Q4) If $x = -2$ is a zero with multiplicity 2 of the polynomial $P(x) = 3x^4 + 6x^3 - 6x^2 + Ax + B$, then find the value of A and B .

Q5) Find the equation of the polynomial $P(x)$ of degree 4 that has the graph given below given below.



Q6) If $P(x) = 2x^4 + 3x^3 + 2x^2 - 3x - 4$, then

a) determine the x -intercept(s) of the graph of P .

b) write $P(x)$ in the factored form.

c) determine where the graph of P will cross the x -axis and where the graph will intersect but does not cross the x -axis.