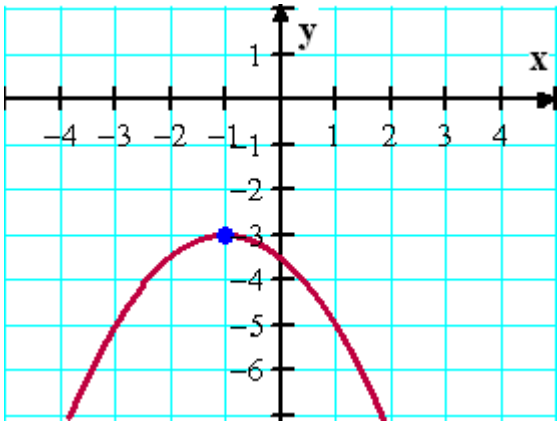
King Fahd University of Petroleum and Minerals
Prep-Year Math Program
Math (001)-Term (181)
Recitation (3. 1)

Question 1: For the quadratic function below:

(a): $f(x)=-\frac{1}{2}(x+1)^2-3$ **(b):** $f(x)=\frac{2}{3}x^2-\frac{8}{3}x+\frac{5}{3}$

Find
(a) axis of symmetry
(b) vertex
(c) domain and range
(d) minimum or maximum value
(e) *x*-intercept and *y*-intercept
(f) interval where the function is increasing and decreasing
(g) interval where the function is above *x*-axis and below x-axis

Answer:



(a): *axis* : $x=-1$

(b): *vertex* $=(-1,-3)$

(c): *domain* $=(-\infty,\infty)$, *range* $=(-\infty,-3]$

(d): maximum $=-3$

(e): has no x-intercept , y – intercept: $y=-3.5$

(f): increasing on $(-\infty,-1]$ and decreasin on $[-1,\infty)$

(g): The graph is below the *x*-axis.

Question 2: The sum of the real coefficients '***a***', '***b***', '***c***' of the quadratic function $f(x)=ax^2+bx+c$ that has **only one** *x*-intercept at -2 and *y*-intercept at 8 is

(a): 2 (b): 16 (c): 18 (d): 8 (e): -21

Answer: (c): 18

Question 3: If -3 is a zero of the quadratic function $f(x)=ax^2+bx+c$ and its graph has lowest point $(-2,-2)$. What is the other zero of this quadratic function?

Answer: $x_2=-1$ is the other zero of the function

Question 4: If a ball is thrown up in the air and its height h, in meter, is a function of time t, in seconds, given by $h(t) = -16t^2 + 128t + 105$, then the time it will take the ball to reach its maximum is

A) 4 seconds

B) 8 seconds

C) 2 seconds

D) 5 seconds

E) 15 seconds

Answer: (a):

Question 5: If $x = -3$ is the axis of symmetry of the parabola $f(x) = -2x^2 - 4cx - c^2 - 7$ for some constant c, then the maximum value of $f(x)$ is equal to

(a) 3 (b) 1 (c) -3 (d) No maximum value (e) 2

Answer: (e): 2

Question6: If $\frac{3}{m}$ is the slope of the line passing through $(2,-3)$ and the vertex of the parabola $y = (x+m)^2 - 5$, then the parabola is increasing in the interval

(a) $(-6,\infty)$

(b) $(-\infty,-6)$

(c) $(6,\ \infty)$

(d) $(-5,\ \infty)$

(e) $(-\infty,\ 5)$

Answer: (c): The graph is increasing on $[6,\infty)$