

King Fahd University of Petroleum and Minerals
Math 001 - Class Test #2

Name: _____, ID#: _____, Section#: _____

Multiple Choice Questions:

1. Which of the following Statements is FALSE?
 - (a) The slope m of the line passing through the points (x_1, y_1) and (x_2, y_2) is given by $m = \frac{y_2 - y_1}{x_2 - x_1}, x_2 \neq x_1$.
 - (b) The slope of a horizontal line is zero.
 - (c) The slope of a vertical line is undefined.
 - (d) Parallel lines have same slopes.
 - (e) Two non-vertical lines are perpendicular if slopes are negative reciprocal of each other.

2. Let $A = \{(4, 7), (3, 7), (2, 5), (8, -8)\}$ and $B = \{(5, 1), (-3, 4), (-3, 2)\}$ be two sets of ordered pairs of the form (x, y) . We can define y as a function of x from
 - (a) The set A only.
 - (b) The set B only.
 - (c) Both sets A and B .
 - (d) Neither the set A nor the set B .

3. The equation $5m^{\frac{3}{4}} = -m^{\frac{1}{2}}$ has:
 - (a) no real solutions.
 - (b) exactly two real solutions.
 - (c) exactly three real solutions.
 - (d) exactly one real solution.

4. The graph of the equation $y = \frac{x^2 - 3}{2x}$ is symmetric with respect to
 - (a) the origin and the x-axis only.
 - (b) the x-axis only.
 - (c) the y-axis only.
 - (d) the y-axis and the x-axis.
 - (e) the origin only.

5. The solution set of the inequality $|5x + 3| > 0$, in interval notation, is:
- (a) $(0, \infty)$
 - (b) $(-\infty, \infty)$
 - (c) ϕ
 - (d) $(-\infty, -\frac{3}{5}) \cup (-\frac{3}{5}, \infty)$
6. Which one of the following statements is TRUE?
- (a) $x < y$ and $x + c < y + c$ are equivalent inequalities.
 - (b) If $a < b$, then $a^2 < b^2$ for all real numbers a and b .
 - (c) If $a < b$, then $ca < cb$ and $\frac{a}{c} < \frac{b}{c}$ for all nonzero real numbers.
 - (d) $\frac{1}{x} < x$ for all real numbers.
7. If the graph of $y = 2x^2 + 3x - 1$ is translated one unit to the left and three units upward, then the equation of the new graph is:
- (a) $y = 2x^2 - x - 5$
 - (b) $y = 2x^2 + 7x + 7$
 - (c) $y = 2x^2 + 6x - 5$
 - (d) $y = 2x^2 + 5x - 4$
 - (e) $y = 2x^2 + 3x + 5$
8. If f is a linear function such that $f(3) = 0$ and $f(6) = -2$, then $f(12)$ is equal to:
- (a) 4
 - (b) -4
 - (c) -6
 - (d) 6

Written Questions:

1. If -4 is a solution for the equation $kx^2 + 10x - 8 = 0$, then
 - (a) Find k .
 - (b) Using the value of k in (a), find the other solution of the equation.
2. Find the solution set of the equation $9x^2 - 6x - 4 = 6x - 3$ by completing the square.
3. Find the solution set of the following equations:
 - (a) $(x - 2)^{\frac{2}{3}} - \sqrt[3]{8x - 16} = 3$
 - (b) $\sqrt{x - 2} - \sqrt{x} = -2$
4. Find the solution set of the following inequalities:
 - (a) $2x + 5 > 1$ and $7x + 6 \leq 3(x + 2)$
 - (b) $|5 - 2x| \leq 3$
 - (c) $\frac{3x+4}{x+1} \geq 2$
5. Find the values of k such that the equation $x^2 - kx + 1 = -x$ has two distinct real roots.
6. Find the equation of a circle having a diameter with end points $(3, -1)$ and $(5, 7)$.
7. If $f(x) = 3x^2 - 1$, then Find $\frac{f(x+h)-f(x)}{h}$.
8. Find the x-intercepts of $f(x) = \lceil -3x + \frac{3}{2} \rceil$, where $\lceil x \rceil$ denotes the greatest integer function.
9. Consider the function $f(x) = 3 - |x - 4|$ and then find the following:
 - (a) The x-intercept(s) if any.
 - (b) The y-intercept if any.
 - (c) Use (a) and (b) to sketch the graph of $f(x)$.
 - (d) Find the Domain and the Range of the function f .
10. Given the function $f(x) = \begin{cases} 3, & \text{if } x \leq -2 \\ x^2, & \text{if } -2 < x \leq 3 \\ -x + 2, & \text{if } 3 < x \leq 7 \end{cases}$
 - (a) Sketch the graph of $f(x)$.
 - (b) Use the graph of $f(x)$ to find:
The intervals where $f(x)$ is increasing.

The intervals where $f(x)$ is decreasing.

The intervals where $f(x)$ is constant.

(c) Find $f(-2) - 3f(0) + f(6) - 2$.

11. Given the function $f(x) = -2x^2 - 4x - 5$

(a) Write $f(x)$ in the standard form.

(b) Find the vertex.

(c) Find the axis of symmetry.

(d) Find, if any, the maximum value of $f(x)$.

(e) Find, if any, the minimum value of $f(x)$.

(f) Find the range of $f(x)$ in the interval notation.

12. Find the equation of a line, which is perpendicular to the line $2x + 3y = 4$ and passing through the point $(-1, 2)$. Write your answer in the form $y = mx + b$.

13. Fill in the spaces with the words "Even, Odd, Neither even or odd"

(a) $f(x) = \sqrt{3 - x^2}$ is _____ function.

(b) $g(x) = \frac{x^3}{x^2+1}$ is _____ function.

(c) $y(x) = 2 + x + x^2$ is _____ function.

14. (a) Find the Domain of the function $f(x) = \frac{\sqrt{x^2-9}}{x-5}$.

(b) Find the Range of the function $f(x) = -\sqrt{x+3} + 2$.

(c) If the distance between the points $A(1, 3)$ and $B(x, 2x)$ is $\sqrt{2}$, then find the value(s) of x .