

Math 01B: Quiz 1

23 February

Name: Answer Key

This is the first quiz. There are 10 questions. Each is worth 10 points, for a total of 100.

Carefully read each question and understand what is being asked before you start to solve the problem. Please show your work in an orderly fashion, and circle or mark in some way your final answers.

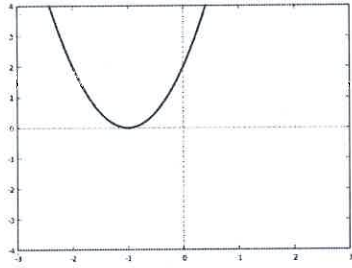
No calculators nor other electronic devices are allowed.

When you are finished, turn in both your exam and your index card with notes.

1		6	
2		7	
3		8	
4		9	
5		10	

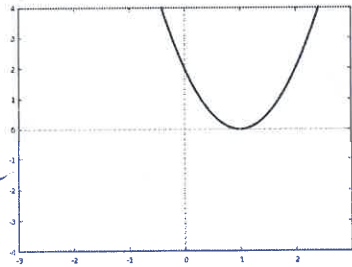
1. Match each graph to the equation which gives it.

D



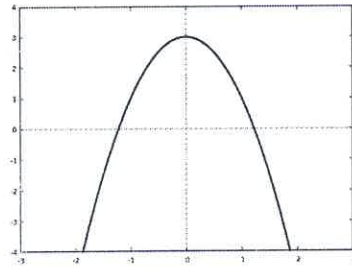
$$A(x) = x(x - 2)$$

C



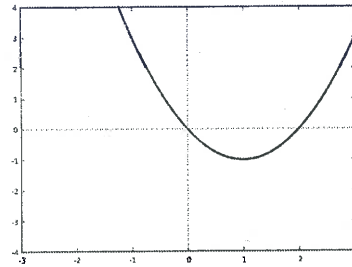
$$B(x) = 3 - 2x^2$$

B



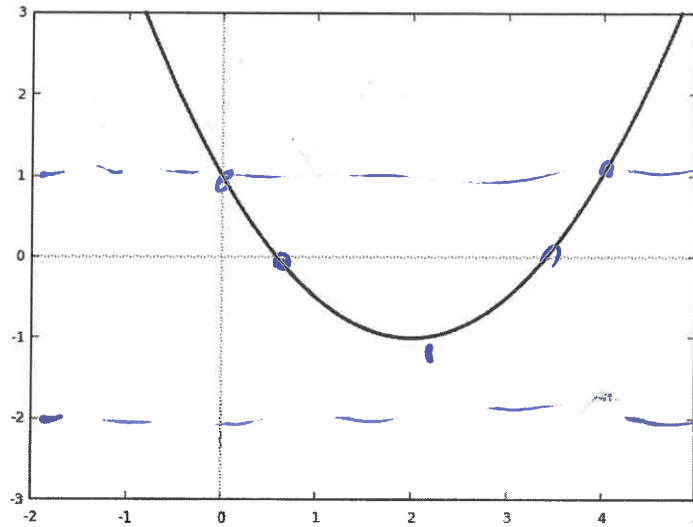
$$C(x) = 2(x - 1)^2$$

A



$$D(x) = 2(x + 1)^2$$

2. A quadratic function $f(x)$ is graphed below.



(a) How many x-intercepts does $f(x)$ have?

2

(b) How many solutions are there to $f(x) = 1$?

2

(c) How many solutions are there to $f(x) = -2$?

0

(d) What is the vertex of $f(x)$?

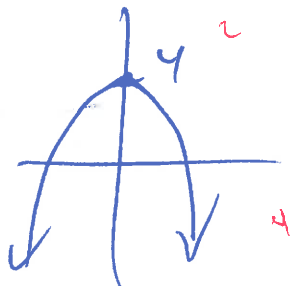
$(2, -1)$

3. Find the y-intercept of the following quadratic function and sketch a graph.

$$y = 4 - x^2$$

y-int: $y = 4 - 0$

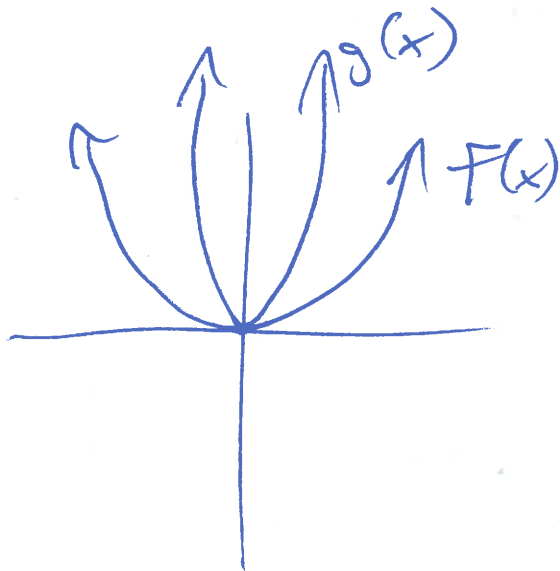
$y = 4$



4. Sketch both of these quadratic functions on the same axes. Label each graph.

$$f(x) = x^2$$

$$g(x) = 3x^2$$

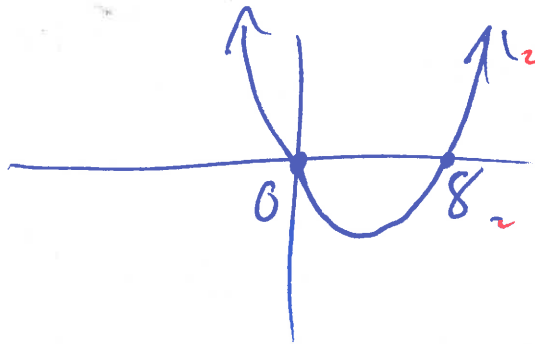


5. Find the x-intercepts of the following quadratic function and sketch a graph.

$$y = x^2 - 8x$$

$$y = x(x - 8)$$

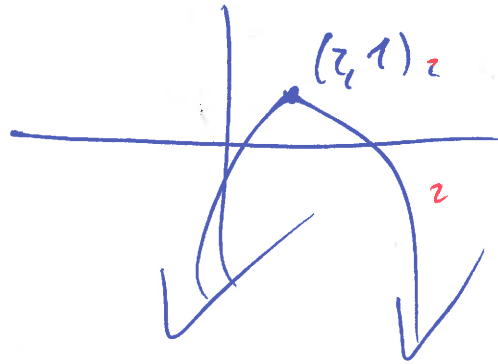
$$x\text{-int: } x = 0, 8$$



6. Find the vertex of the following quadratic function and sketch a graph. Identify the vertex on your graph.

$$y = -\frac{1}{2}(x - 2)^2 + 1$$

$$\text{vertex } (2, 1)$$

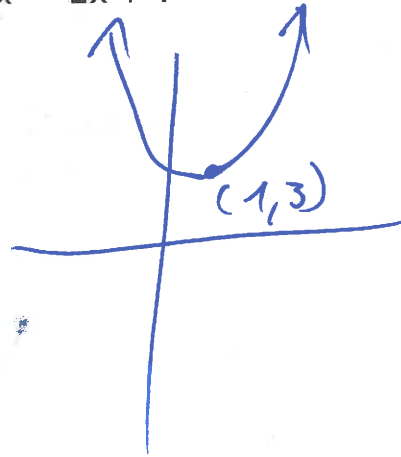


7. Find the vertex of the following quadratic function and sketch a graph. Identify the vertex on your graph.

$$y = x^2 - 2x + 4$$

$$\text{Vertex @ } x = \frac{2}{2} = 1$$

$$\begin{aligned} y &= (1)^2 - 2(1) + 4 \\ &= 1 - 2 + 4 \\ &= 3 \end{aligned}$$



8. Is the following function even, odd, or neither? Support your answer with a calculation.

$$f(x) = -\frac{x^2 + 4}{x^3}$$

$$f(-x) = -\frac{(-x)^2 + 4}{(-x)^3} = -\frac{x^2 + 4}{-x^3} = \frac{x^2 + 4}{x^3} = -f(x)$$

odd

9. Find the vertex of the following function. Sketch a graph of it, identifying the vertex on the graph.

x-int: 0, 6

vertex at

$$x = \frac{0+6}{2} = 3$$

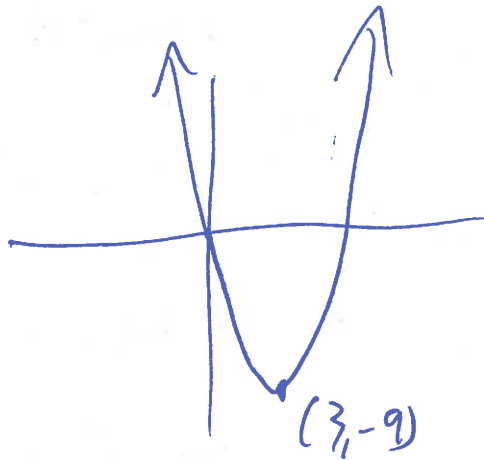
$$y = 3^2 - 6 \cdot 3$$

$$= 9 - 18$$

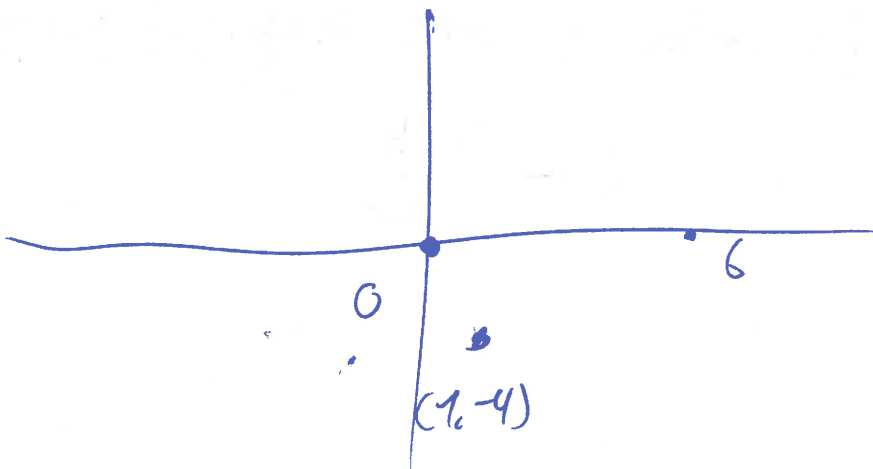
$$= -9$$

$$y = x^2 - 6x$$

$$= x(x-6)$$



10. Is there a quadratic function whose x-intercepts are $x = 0, 6$ and whose vertex is at $(1, -4)$. If so, sketch a graph. If not, explain why.



No, because the vertex must be ~~the~~
~~half~~ way between the x-intercepts

11. Extra credit (up to +5): Explain where the formula $x = -b/(2a)$ for finding the vertex of a quadratic in standard form comes from.

~~$y = ax^2 + bx + c$~~ is a vertical shift of
 $y = ax^2 + b$, so they have the same
x-coord. For the vertex,

We can find ~~it by factoring~~ the x-intercepts
by factoring:

$$0 = x(ax + b)$$

$$x = 0 \text{ or } x = -\frac{b}{a}.$$

the vertex is at the midpoint, namely

$$x = -\frac{b}{2a}$$