

1. Solve by Completing The Square

$$m^2 - 6m + 2 = 0$$

$$m^2 - 6m + \frac{9}{9} = -2 + \frac{9}{9}$$

$$\sqrt{(m-3)^2} = \sqrt{7}$$

$$m-3 = \pm\sqrt{7}$$

+3 +3

$$m = 3 \pm \sqrt{7}$$

2. Solve by Completing The Square

$$x^2 + 8x = 20 \quad x^2 + bx = c$$

$$x^2 + 8x + 16 = 20 + 16$$

$$\sqrt{(x+4)^2} = \sqrt{36}$$

$$x+4 = \pm 6$$

$$x+4 = 6$$

-4 -4

$$x = 2$$

$$x+4 = -6$$

-4 -4

$$x = -10$$

3. Multiply

a. $(m^3 - 2)(5m - n)$

$$5m^4 - m^3n - 10m + 2n$$

b. $(5x^3)(4y^2) = 20x^3y^2$

c. $7xy(3x^2 + 4y - 2)$

$$21x^3y + 28xy^2 - 14xy$$

d. $(x-5)^2$

$$(x-5)(x-5)$$

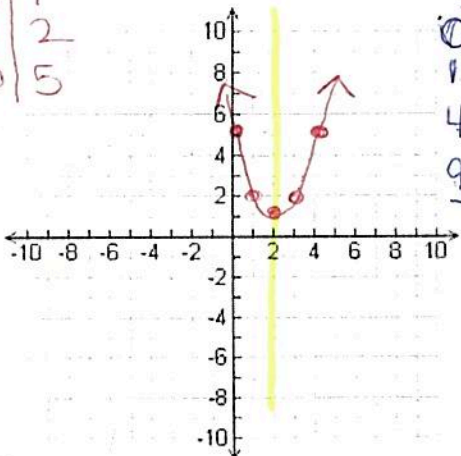
$$x^2 - 5x - 5x + 25$$

$$x^2 - 10x + 25$$

4. Graph $g(x) = (x-2)^2 + 1$

v: (2, 1)

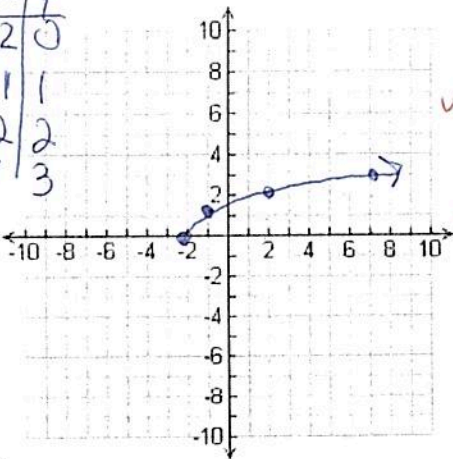
x	y
2	1
1	2
3	2
0	5



5. Graph $h(x) = \sqrt{x+2}$

v: (-2, 0)

x	y
-2	0
-1	1
2	2
7	3

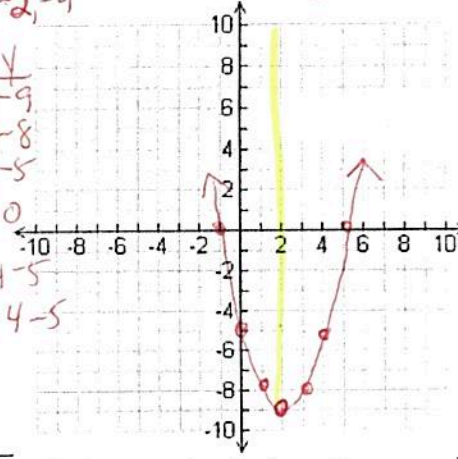


6. Graph $h(x) = x^2 - 4x - 5$

$\frac{-b}{2a} = \frac{-(-4)}{2(1)} = 2$
 $4 - 8 - 5 = -9$
 v: (2, -9)

v: (2, -9)

x	y
2	-9
1	-8
0	-5
-1	0
1	-4
5	-4



7. Tell whether the function is linear, quadratic or exponential. Explain.

{(-4, 8), (-2, 2), (0, 0), (2, 2), (4, 8)}

x	y
-4	8
-2	2
0	0
2	2
4	8

2nd diff

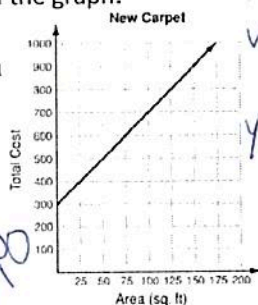
Quadratic is same

8. The Johnsons are putting new carpet in their home. Installation is \$300 and the carpeting costs \$4 per square foot. The total price of the job as a function of area is shown in the graph.

a. Write an equation that represents the total price as a function of area.

$$y = 4x + 300$$

m b



b. Identify the slope and y-intercept and describe their meanings.

m: cost per sq. foot \$4

b: installation fee

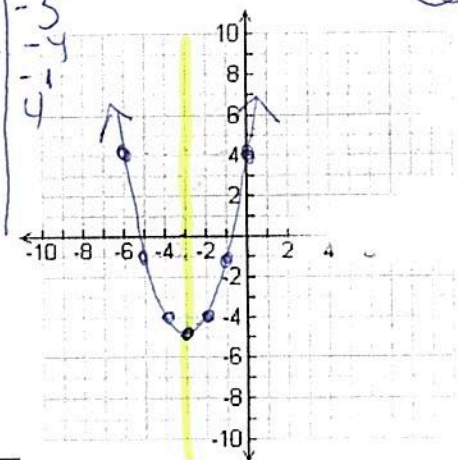
9. Graph the quadratic function

$$f(x) = x^2 + 6x + 4$$

v: -3, -5

x	y
-3	-5
-2	-4
-1	-1
0	4

$\frac{-b}{2a} = \frac{-6}{2(1)} = -3$
 $9 - 18 + 4 = -5$



10. Write an explicit rule for the geometric sequence
 $-16, 4, -1, \frac{1}{4}, \dots$

$a_1 = -16$
 $r = -\frac{1}{4}$

$a_n = a_1 (r^{n-1})$
 $a_n = -16 \left(-\frac{1}{4}\right)^{n-1}$

Find the next two terms.

$-\frac{1}{16}, \frac{1}{64}$

13. How many solutions and what type of solution does the equation $x^2 - 4x = 12$ have?

$b^2 - 4ac = 0$

$x^2 - 4x - 12 = 0$

$16 - 4(1)(-12)$

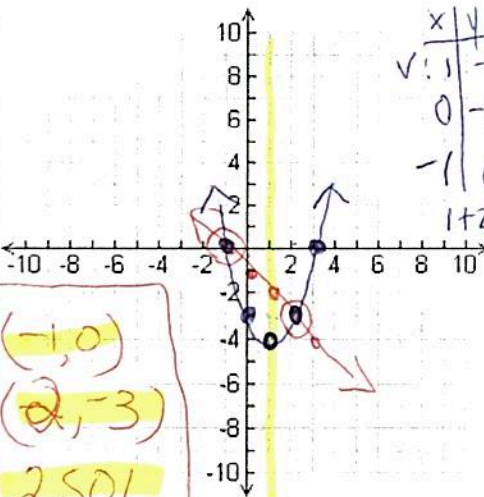
$a = 1$
 $b = -4$
 $c = -12$

$16 + 48 = 64 \rightarrow 2 \text{ SOL}$

POS \rightarrow 2 SOL
 0 \rightarrow 1 SOL
 NEG \rightarrow 0 SOL

16. Solve the nonlinear system by graphing.

$\begin{cases} y = x^2 - 2x - 3 \\ y = -x - 1 \end{cases}$



$(-1, 0)$
 $(2, -3)$
 2 SOL

11. Solve for b ; $A = \frac{a+b+c}{3}$

$3A = a + b + c$
 $-a - c - a - c$

$3A - a - c = b$

12. a) Solve for a ; $d = \frac{1}{2}at^2$

$\frac{2d}{1t^2} = a \cdot \frac{1}{2}t^2 \cdot \frac{1}{2}t^2$

b) Solve for v ; $F = \frac{mv^2}{r}$

$\frac{Fr}{m} = \frac{mv^2}{m}$
 $\sqrt{\frac{Fr}{m}} = \sqrt{v^2}$
 $\pm \sqrt{\frac{Fr}{m}} = v$

14. The elephant population in northwestern Namibia and Etosha National Park can be predicted by the expression $f(b) = 2649(1.045)^b$, where b is the number of years since 1995. Is this exponential growth or decay? growth

What is the growth/decay rate? 4.5%

What does the value 2,649 represent?
y intercept

- A. The predicted increase in the number of elephants in the region each year
- B. The predicted number of elephants in the region in 1995
- C. The year when the elephant population is predicted to stop increasing
- D. The percentage the elephant population is predicted to increase each year

15. Solve the system $\begin{cases} 4x - y = 2 \\ y = x^2 + 1 \end{cases}$

$4x - (x^2 + 1) = 2$

$4x - x^2 - 1 = 2$
 $-4x + x^2 + 1 + 1 + x^2 - 4x$

$x^2 - 4x + 3 = 0$

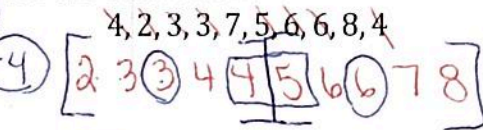
$(x - 3)(x - 1) = 0$

$x = 3 \quad x = 1$

$y = 3^2 + 1 \quad y = 10$ $(3, 10)$

$y = 1^2 + 1 \quad y = 2$ $(1, 2)$

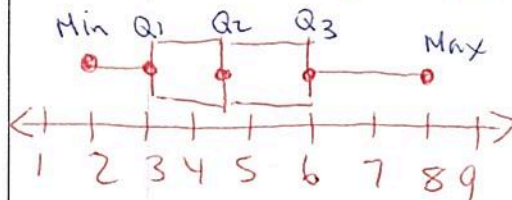
17. Draw a box and whisker plot for the data below.



Min: 2 Max: 8

Median(Q2): 4.5 LQ(Q1): 3

UP(Q3): 6 IQR: 6 - 3 = 3



18. Find the average rate of change of the function $f(x) = x^2 + 5$ over the interval $[1, 4]$.

$\frac{f(b) - f(a)}{b - a}$

$\frac{21 - 6}{4 - 1} = \frac{15}{3} = 5$
 ARC

Is the average rate of change of a quadratic function constant or variable? Explain.

Variable. Changes depending on the interval