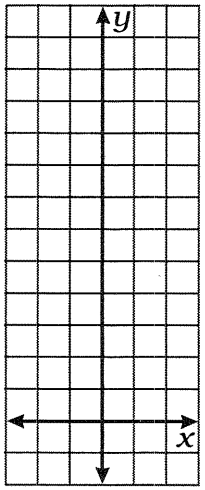
Who Is An Expert at Catching Small Green Vegetables?

Complete each table and graph. For table cells with letters, write the letter in the corresponding box at the right.

2	5	−3	−1	0	12	9	1	−7	−8	8	−5	6	3	7	−12	4	−2

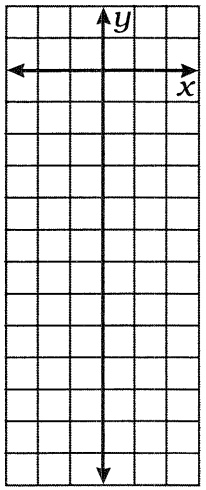
1 $y = 3x^2$

x	y
2	
1	
0	
−1	R
−2	



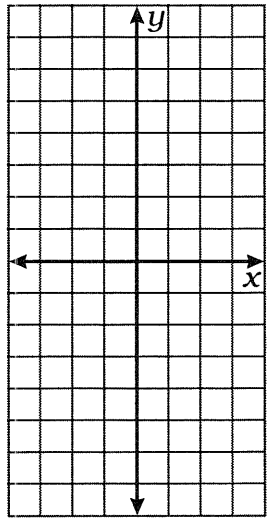
2 $y = -3x^2$

x	y
2	
1	
0	A
−1	
−2	I



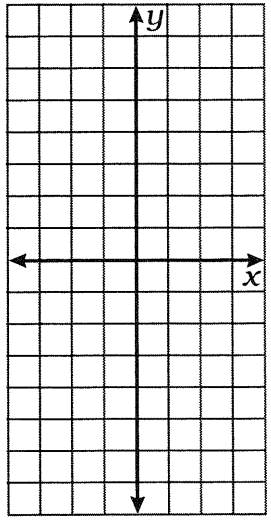
3 $y = \frac{1}{2}x^2$

x	y
4	
2	A
0	
−2	
−4	S



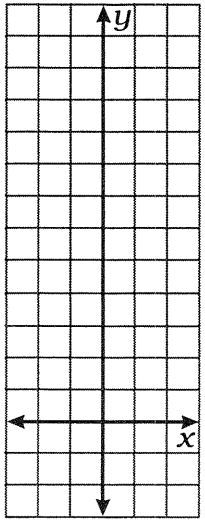
4 $y = -\frac{1}{2}x^2$

x	y
4	A
2	
0	
−2	T
−4	



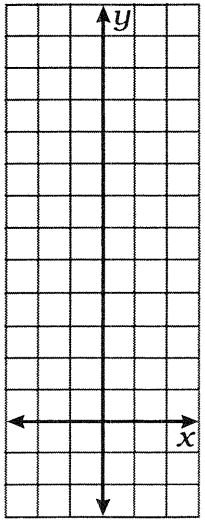
5 $y = x^2 - 3$

x	y
3	
2	
1	
0	T
−1	
−2	
−3	A



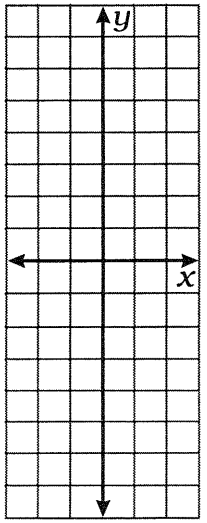
6 $y = x^2 + 3$

x	y
3	P
2	
1	
0	
−1	S
−2	
−3	



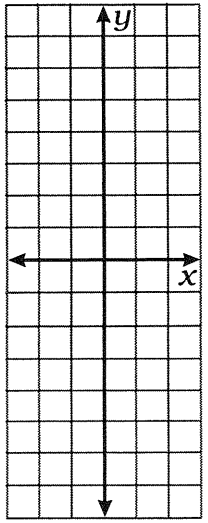
7 $y = 2x^2 - 1$

x	y
2	
1	P
0	
−1	
−2	T



8 $y = -2x^2 + 1$

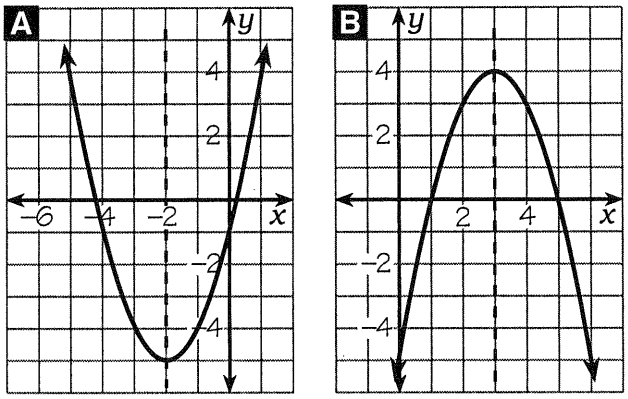
x	y
2	E
1	
0	
−1	R
−2	



What Is One Problem That Rocket Scientist, Dr. Awkward, Never Has?

Write the letter of the correct answer in each box containing the exercise number.

In Exercises 1-4, use the graphs at the right to find the following:



1. The equation of the axis of symmetry for Graph A.
2. The coordinates of the vertex for Graph A.
3. The equation of the axis of symmetry for Graph B.
4. The coordinates of the vertex for Graph B.

Answers 1-4

- F $x = 0$
- D $x = 3$
- B $x = -2$
- Y $(3, 3)$
- I $(-2, -5)$
- V $(-2, -3)$
- G $(3, 4)$

In Exercises 5-12, find the equation of the axis of symmetry and the coordinates of the vertex point of the function. (Only the vertex point is given in the answer column.)

5. $y = x^2 - 4x + 1$
6. $f(x) = x^2 + 6x + 5$
7. $y = 2x^2 - 9$
8. $y = 2x^2 + 8x - 3$
9. $f(x) = -3x^2 + 6x + 4$
10. $y = -2x^2 + 10x - 7$
11. $y = \frac{1}{2}x^2 + 4x + 1$
12. $f(x) = -\frac{1}{2}x^2 + 3x - 2$

Answers 5-12

- P $(-4, -7)$
- S $(1, -4)$
- H $(-2, -11)$
- C $(2, -3)$
- T $(2.5, 8)$
- W $(1, 7)$
- E $(-3, -4)$
- U $(2, -9)$
- L $(-2, -7)$
- N $(3, 2.5)$
- M $(2.5, 5.5)$
- R $(0, -9)$
- K $(-4, -3)$
- O $(-3, 2)$

In Exercises 13-16, use the vertical motion formula given in the box below.

If an object is thrown upward, its approximate height h (in feet) is given by the formula: $h = -16t^2 + vt + c$, where t is the time in motion (in seconds), v is the initial upward velocity (in feet per second), and c is the initial height (in feet).

Zen throws a ball upward with an initial upward velocity of 64 ft/s. The ball is 5 ft above the ground when it leaves Zen's hand.

13. In how many seconds will the ball reach its maximum height?
14. What is the ball's maximum height?

A fireworks rocket is shot upward with an initial velocity of 80 ft/s. The rocket is 3 ft above the ground when it is fired.

15. In how many seconds will the rocket reach its maximum height?
16. What is the rocket's maximum height?

Answers 13-16

- A 2.5 sec
- K 2 sec
- T 2.8 sec
- O 88 ft
- L 69 ft
- S 103 ft

16	11	6	14	14	2	12	4	8	2	16	12	15	10	6	1	15	5	13	9	15	7	3	16