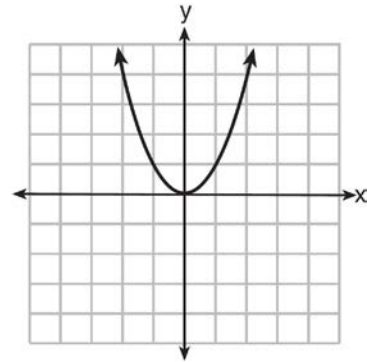
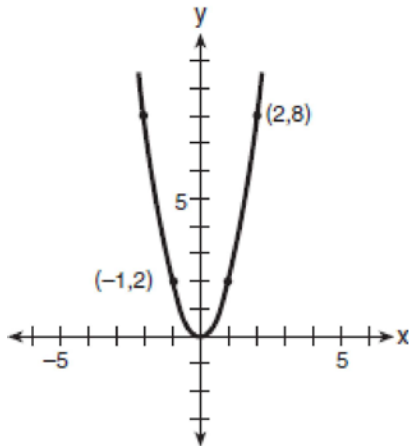


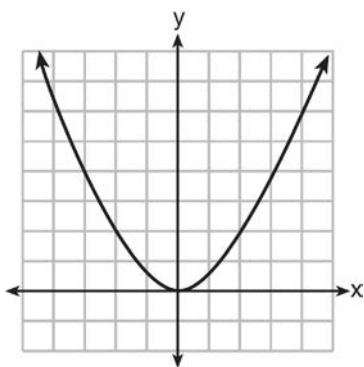
**A.G.5: Graphing Quadratic Functions: Investigate and generalize how changing the coefficients of a function affects its graph**

- 1 Which quadratic function is shown in the accompanying graph?

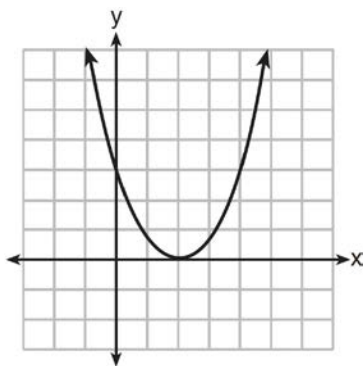


Which graph represents  $y = 2x^2$ ?

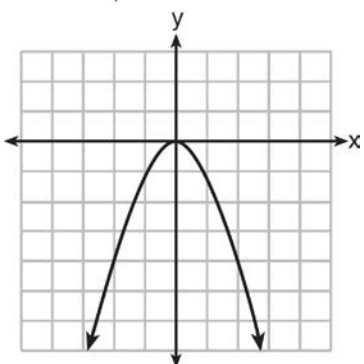
- 1)  $y = -2x^2$
  - 2)  $y = 2x^2$
  - 3)  $y = -\frac{1}{2}x^2$
  - 4)  $y = \frac{1}{2}x^2$
- 2 Which is the equation of a parabola that has the same vertex as the parabola represented by  $y = x^2$ , but is wider?
- 1)  $y = x^2 + 2$
  - 2)  $y = x^2 - 2$
  - 3)  $y = 2x^2$
  - 4)  $y = \frac{1}{2}x^2$
- 3 The graph of  $y = x^2$  is shown below.



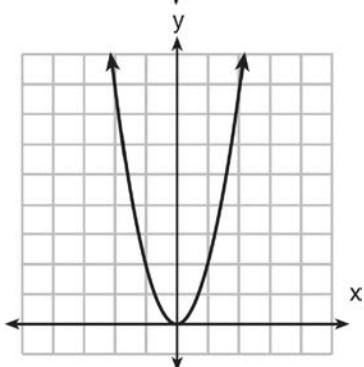
1)



2)

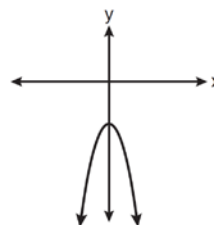


3)

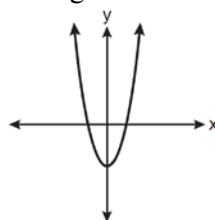


4)

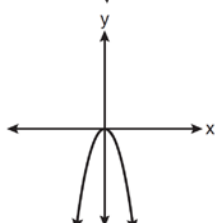
4 The diagram below shows the graph of  $y = -x^2 - c$ .



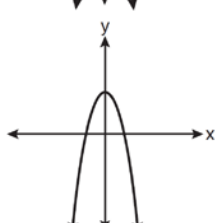
Which diagram shows the graph of  $y = x^2 - c$ ?



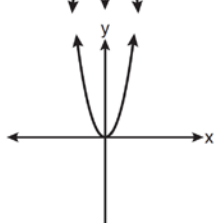
1)



2)

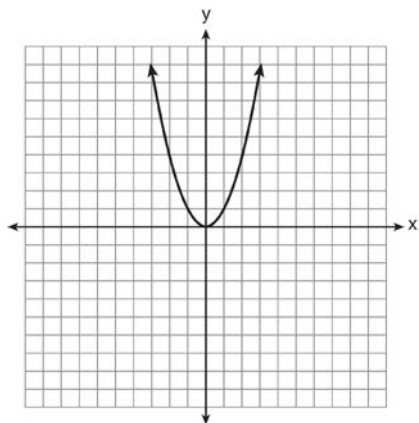


3)



4)

- 5 The graph of the equation  $y = x^2$  is shown below.



Which statement best describes the change in this graph when the coefficient of  $x^2$  is multiplied by 4?

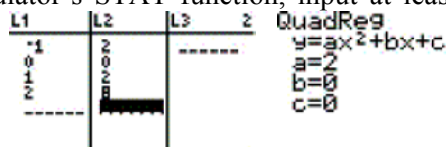
- 1) The parabola becomes wider.
  - 2) The parabola becomes narrower.
  - 3) The parabola will shift up four units.
  - 4) The parabola will shift right four units.
- 6 Melissa graphed the equation  $y = x^2$  and Dave graphed the equation  $y = -3x^2$  on the same coordinate grid. What is the relationship between the graphs that Melissa and Dave drew?
- 1) Dave's graph is wider and opens in the opposite direction from Melissa's graph.
  - 2) Dave's graph is narrower and opens in the opposite direction from Melissa's graph.
  - 3) Dave's graph is wider and is three units below Melissa's graph.
  - 4) Dave's graph is narrower and is three units to the left of Melissa's graph.
- 7 Consider the graph of the equation  $y = ax^2 + bx + c$ , when  $a \neq 0$ . If  $a$  is multiplied by 3, what is true of the graph of the resulting parabola?
- 1) The vertex is 3 units above the vertex of the original parabola.
  - 2) The new parabola is 3 units to the right of the original parabola.
  - 3) The new parabola is wider than the original parabola.
  - 4) The new parabola is narrower than the original parabola.
- 8 The graph of a parabola is represented by the equation  $y = ax^2$  where  $a$  is a positive integer. If  $a$  is multiplied by 2, the new parabola will become
- 1) narrower and open downward
  - 2) narrower and open upward
  - 3) wider and open downward
  - 4) wider and open upward
- 9 How is the graph of  $y = x^2 + 4x + 3$  affected when the coefficient of  $x^2$  is changed to a smaller positive number?
- 1) The graph becomes wider, and the y-intercept changes.
  - 2) The graph becomes wider, and the y-intercept stays the same.
  - 3) The graph becomes narrower, and the y-intercept changes.
  - 4) The graph becomes narrower, and the y-intercept stays the same.

### A.G.5: Graphing Quadratic Functions: Investigate and generalize how changing the coefficients of a function affects its graph

#### Answer Section

1 ANS: 2

Since the parabola is cupped up,  $a > 0$ , eliminating (1) and (3). The point (2, 8) satisfies only  $y = 2x^2$ . You can also use a graphing calculator's STAT function, input at least three ordered pairs, and calculate the quadratic



regression line of best fit. L2(5) = . ■

REF: 060404b

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|----------|---------------|
| 2 ANS: 4 | REF: 081322ia |
| 3 ANS: 4 | REF: 061503ia |
| 4 ANS: 1 | REF: 081015ia |
| 5 ANS: 2 | REF: 081414ia |
| 6 ANS: 2 | REF: 061113ia |
| 7 ANS: 4 | REF: 060829ia |
| 8 ANS: 2 | REF: 081218ia |
| 9 ANS: 2 | REF: 011330ia |