Name: _____

IM2 Semester 1 Final Exam Review C
(Study Guide Questions 10-12, 34-36 & 52-54)

Matching Graphs to Equations

To identify equations in vertex form (problems 10–12):

Identify the vertex on the graph.

The vertex is the point (h, k) and is located where the graph turns.

Plug the vertex point (h, k) into vertex form: $y = (x - h)^2 + k$.

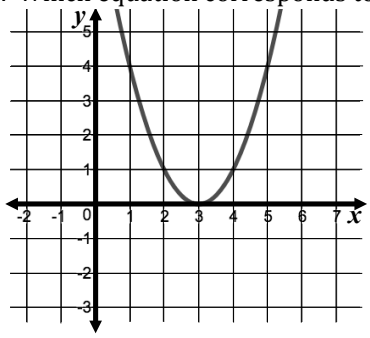
Remember to switch the sign of h, but keep the sign of k.

For example: If the vertex is $(-9, 7)$, then the equation is $y = (x\boxed{+9})^2\boxed{+7}$.

If $h = 0$, *then the equation will look like:* $y = x^2 + k$.

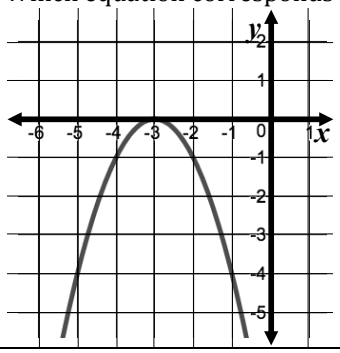
If $k = 0$, *then the equation will look like:* $y = (x - h)^2$.

1. Which equation corresponds to the graph shown?



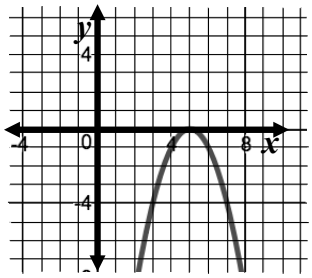
a. $y = (x + 3)^2$
b. $y = x^2 + 3$
c. $y = (x - 3)^2$
d. $y = x^2 - 3$

2. Which equation corresponds to the graph shown?



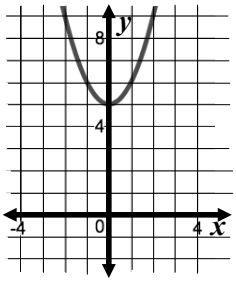
a. $y = (x + 3)^2$
b. $y = x^2 + 3$
c. $y = (x - 3)^2$
d. $y = x^2 - 3$

3. Which equation corresponds to the graph shown?



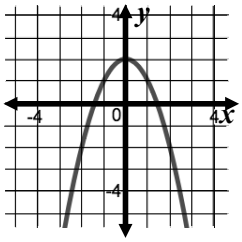
a. $y = (x + 5)^2$
b. $y = (x - 5)^2$
c. $y = x^2 + 5$
d. $y = x^2 - 5$

4. Which equation corresponds to the graph shown?



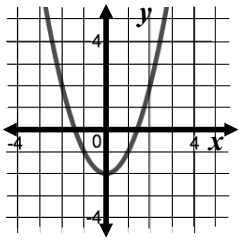
a. $y = (x + 5)^2$
b. $y = (x - 5)^2$
c. $y = x^2 + 5$
d. $y = x^2 - 5$

5. Which equation corresponds to the graph shown?



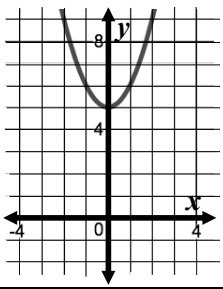
a. $y = -(x + 2)^2$
b. $y = -(x - 2)^2$
c. $y = -x^2 + 2$
d. $y = -x^2 - 2$

6. Which equation corresponds to the graph shown?



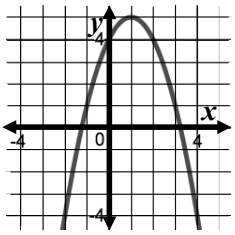
a. $y = (x + 2)^2$
b. $y = (x - 2)^2$
c. $y = x^2 + 2$
d. $y = x^2 - 2$

7. Which equation corresponds to the graph shown?



a. $y = (x + 5)^2$
b. $y = (x - 5)^2$
c. $y = x^2 + 5$
d. $y = x^2 - 5$

8. Which equation corresponds to the graph shown?



a. $y = -(x + 1)^2 + 5$
b. $y = -(x - 1)^2 + 5$
c. $y = -(x + 1)^2 - 5$
d. $y = -(x - 1)^2 - 5$

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To identify equations in factored form (problems 34–36):

Identify the roots on the graph.

The roots are where the parabola crosses the x-axis (the flat axis).

Plug the roots $(r_1, 0)$ & $(r_2, 0)$ into factored form: $y = (x - r_1)(x - r_2)$.

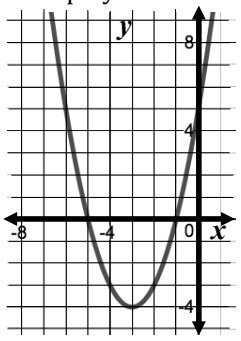
Remember to switch the signs for both roots.

For example: If the roots are $(-9, 0)$ & $(7, 0)$, then the equation is $y = (x\boxed{+9})(x\boxed{-7})$.

If $r_1 = 0$, *then the equation will look like:* $y = (x)(x - r_2)$.

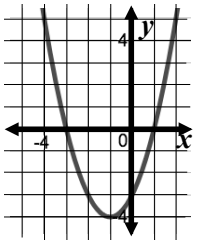
If there is only one root (the vertex is on the *x*-axis), then use that root twice: $y = (x - r_1)(x - r_1)$.

9. Which polynomial does the graph represent?



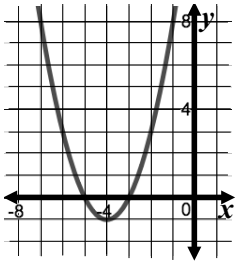
a. $y = (x + 1)(x + 5)$
b. $y = (x - 1)(x - 5)$
c. $y = (x + 1)(x - 5)$
d. $y = (x - 1)(x + 5)$

10. Which polynomial does the graph represent?



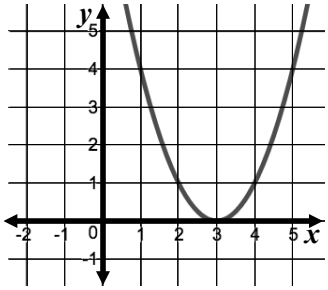
a. $y = (x + 1)(x + 3)$
b. $y = (x + 1)(x - 3)$
c. $y = (x - 1)(x + 3)$
d. $y = (x - 1)(x - 3)$

11. Which polynomial does the graph represent?



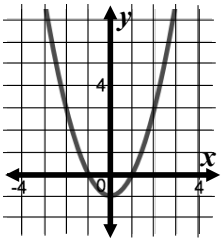
a. $y = (x + 3)(x + 5)$
b. $y = (x - 3)(x + 5)$
c. $y = (x + 3)(x - 5)$
d. $y = (x - 3)(x - 5)$

12. Which polynomial does the graph represent?



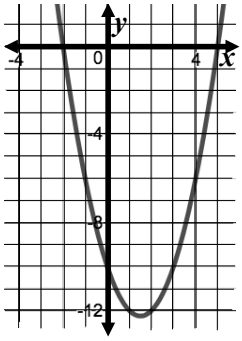
a. $y = (x + 3)(x + 3)$
b. $y = (x - 3)(x - 3)$
c. $y = (x)(x + 3)$
d. $y = (x)(x - 3)$

13. Which polynomial does the graph represent?



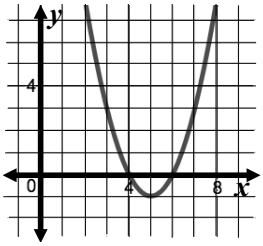
a. $y = (x + 1)(x + 1)$
b. $y = (x)(x + 1)$
c. $y = (x + 1)(x - 1)$
d. $y = (x)(x - 1)$

14. Which polynomial does the graph represent?



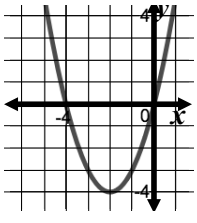
a. $y = (x - 2)(x - 5)$
b. $y = (x + 2)(x + 5)$
c. $y = (x - 2)(x + 5)$
d. $y = (x + 2)(x - 5)$

15. Which polynomial does the graph represent?



a. $y = (x - 4)(x + 6)$
b. $y = (x + 4)(x - 6)$
c. $y = (x - 4)(x - 6)$
d. $y = (x + 4)(x + 6)$

16. Which polynomial does the graph represent?



a. $y = (x)(x - 4)$
b. $y = (x)(x + 4)$
c. $y = (x - 2)(x - 4)$
d. $y = (x + 2)(x + 4)$

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To identify piecewise graphs (problems 52–54):

A piecewise graph with two equations will have 4 points.

The four x-values are written on the right in inequalities.

Plug each x-value into the left-side equation on the same line to find its y-value.

If the left-side equation is just a number, then that is your y-value. You don't have to plug anything in.

The points will be either open or closed, depending on the symbol that is next to the *x*-value.

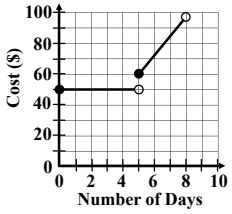
$$y = \begin{cases} plug\ x's\ in\ here\ to\ get\ y, & 1st\ point's\ x\ \boxed{<\circ\ or\ \leq\cdot}\ x\ \boxed{<\circ\ or\ \leq\cdot}\ 2nd\ point's\ x \\ plug\ x's\ in\ here\ to\ get\ y, & 3rd\ point's\ x\ \boxed{<\circ\ or\ \leq\cdot}\ x\ \boxed{<\circ\ or\ \leq\cdot}\ 4th\ point's\ x \end{cases}$$

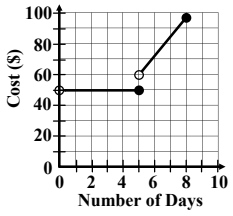
The 2 points from each line are connected to each other, but *not connected* to the other line's points.

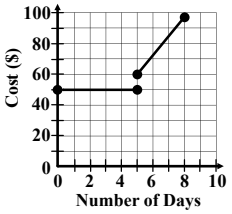
17. The cost, y, in dollars, of renting a car for x days is shown using the function below.

$$y = \begin{cases} 50, & 0 < x \leq 5 \\ 12x, & 5 < x \leq 8 \end{cases}$$

Which of the following graphs models the cost of renting a car?

A. 

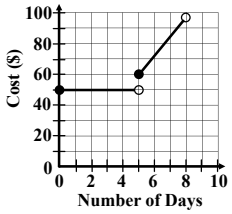
B. 

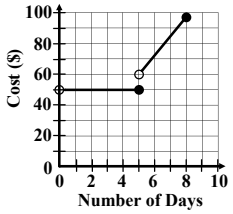
C. 

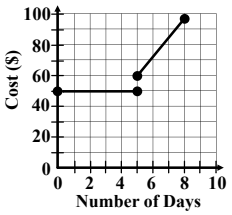
18. The cost, y, in dollars, of renting a car for x days is shown using the function below.

$$y = \begin{cases} 50, & 0 \leq x < 5 \\ 12x, & 5 \leq x < 8 \end{cases}$$

Which of the following graphs models the cost of renting a car?

A. 

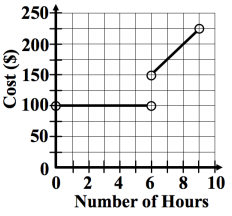
B. 

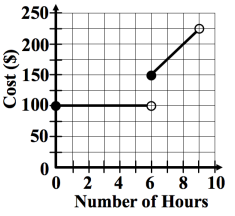
C. 

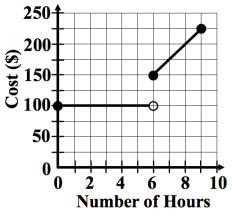
19. The cost, y, in dollars, of using a recording studio for x hours is shown using the function below.

$$y = \begin{cases} 100, & 0 \leq x < 6 \\ 25x, & 6 \leq x \leq 9 \end{cases}$$

Which of the following graphs models the cost of using the studio?

A. 

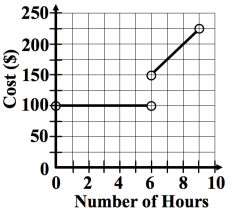
B. 

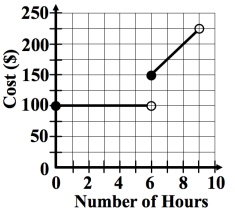
C. 

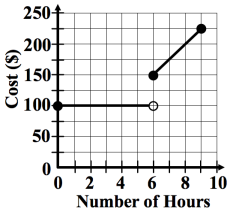
20. The cost, y, in dollars, of using a recording studio for x hours is shown using the function below.

$$y = \begin{cases} 100, & 0 \leq x < 6 \\ 25x, & 6 \leq x < 9 \end{cases}$$

Which of the following graphs models the cost of using the studio?

A. 

B. 

C. 

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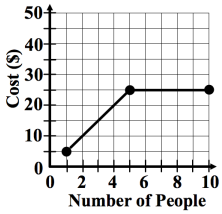
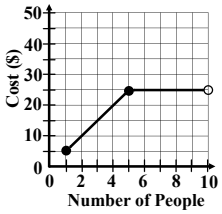
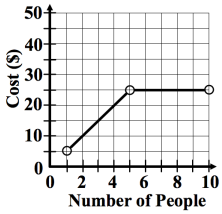
21. The cost, y, in dollars, of hosting a group party for x people at a laser tag arena is shown using the function below.

$$y = \begin{cases} 5x, & 1 \le x \le 5 \\ 25, & 5 \le x \le 10 \end{cases}$$

Which of the following graphs models the cost of a party at this laser tag arena?

A. 

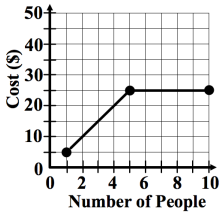
B. 

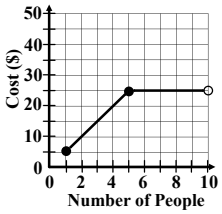
C. 

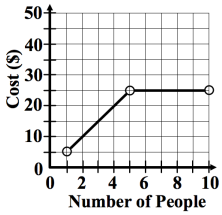
22. The cost, y, in dollars, of hosting a group party for x people at a laser tag arena is shown using the function below.

$$y = \begin{cases} 5x, & 1 \le x \le 5 \\ 25, & 5 \le x < 10 \end{cases}$$

Which of the following graphs models the cost of a party at this laser tag arena?

A. 

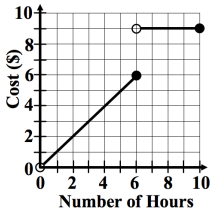
B. 

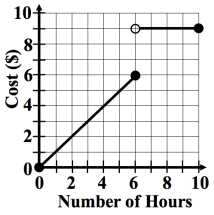
C. 

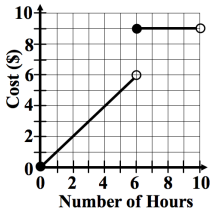
23. The cost, y, in dollars, of parking a car for x hours at a parking lot during the day is shown using the function below.

$$y = \begin{cases} x, & 0 < x \le 6 \\ 9, & 6 < x \le 10 \end{cases}$$

Which of the following graphs models the cost of parking at this parking lot?

A. 

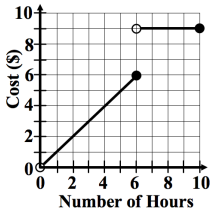
B. 

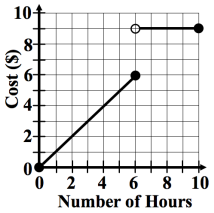
C. 

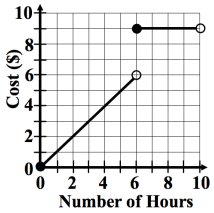
24. The cost, y, in dollars, of parking a car for x hours at a parking lot during the day is shown using the function below.

$$y = \begin{cases} x, & 0 \le x < 6 \\ 9, & 6 \le x < 10 \end{cases}$$

Which of the following graphs models the cost of parking at this parking lot?

A. 

B. 

C. 

Answers

1. C	2. A	3. B	4. C	5. C	6. D	7. C	8. B
9. A	10. C	11. A	12. A	13. C	14. D	15. C	16. B
17. B	18. A	19. C	20. B	21. A	22. B	23. A	24. C