

Quadratic Transformations Worksheet

1. Complete the following chart

Equation	Mapping Rule	Vertex	Equation of Axis of Symmetry	Transformations (compared to $y = x^2$)	Graph
$y = -3(x+4)^2 + 5$	$(x,y) \rightarrow (x-4, -3y+5)$	$(-4, 5)$	$x = -4$	V.S. Factor 3 Reflect in x-axis H.T. Left 4 V.T. Up 5	
$y = 2(x-7)^2 + 1$	$(x,y) \rightarrow (x+7, 2y+1)$	$(7, 1)$	$x = 7$	V.S. Factor 2 H.T. Right 7 V.T. Up 1	
$y = -(x+6)^2 + 2$	$(x,y) \rightarrow (x-6, -y+2)$	$(-6, 2)$	$x = -6$	Reflect in x-axis H.T. Left 6 V.T. Up 2	
$y = \frac{1}{2}(x-1)^2 - 5$	$(x,y) \rightarrow (x+1, \frac{1}{2}y-5)$	$(1, -5)$	$x = 1$	V.C. Factor 1/2 H.T. Right 1 V.T. Down 5	
$y = 6(x+4)^2 + 3$	$(x,y) \rightarrow (x-4, 6y+3)$	$(-4, 3)$	$x = -4$	V.S. Factor 6 H.T. Left 4 V.T. Up 3	

2. Write the equation of a parabola whose vertex is $(4, -1)$ and passes through the point $(2, 3)$.

$$y = a(x-h)^2 + k \quad \rightarrow \quad \begin{aligned} 3 &= 4a - 1 \\ 3 &= a(2-4)^2 - 1 \\ 3 &= 4a - 1 \\ 4 &= 4a \\ 1 &= a \end{aligned} \quad y = (x-4)^2 - 1$$

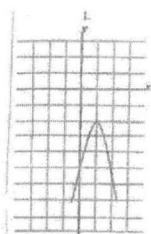
3. Write the equation of a parabola whose vertex is $(-3, 5)$ and passes through the point $(2, 7)$.

$$y = a(x-h)^2 + k \quad \rightarrow \quad \begin{aligned} 7 &= 25a + 5 \\ 7 &= a(2+3)^2 + 5 \\ 2 &= 25a \\ \frac{2}{25} &= a \end{aligned} \quad y = \frac{2}{25}(x+3)^2 + 5$$

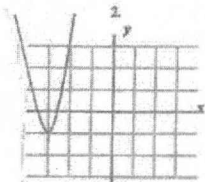
4. Write the equation of a parabola whose vertex is $(-2, -1)$ and passes through the point $(4, -7)$.

$$y = a(x-h)^2 + k \quad \rightarrow \quad \begin{aligned} -7 &= 36a - 1 \\ -7 &= a(4+2)^2 - 1 \\ -6 &= 36a \\ -\frac{1}{6} &= a \end{aligned} \quad y = -\frac{1}{6}(x+2)^2 - 1$$

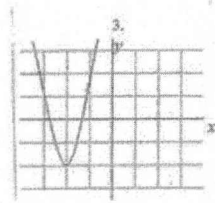
5. Match each quadratic function with its graph.



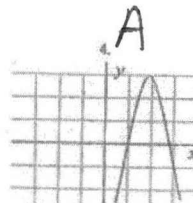
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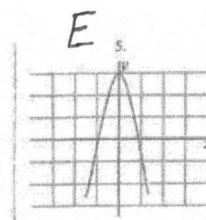
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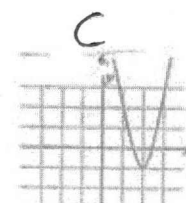
B



A



E



C

- A. $y = -(x-2)^2 + 3$
- B. $y + 2 = (x+2)^2$
- C. $y = (x-2)^2 - 1$
- D. $-(y+2) = (x-1)^2$
- E. $y = -x^2 + 3$
- F. $y + 1 = (x+3)^2$

B $y = (x+2)^2 - 2$
 D $y = -(x-1)^2 - 2$
 F $y = (x+3)^2 - 1$