

Vertex Form of Parabolas

Use the information provided to write the vertex form equation of each parabola.

1) $y = x^2 + 16x + 71$
 $y = (x^2 + 16x + 64) - 64 + 71$
 $y = (x+8)^2 + 7$

2) $y = x^2 - 2x - 5$
 $y = (x^2 - 2x + 1) - 1 - 5$
 $y = (x-1)^2 - 6$

3) $y = -x^2 - 14x - 59$
 $y = -1(x^2 + 14x + 49) - 59 + 49$
 $y = -(x+7)^2 - 10$

4) $y = 2x^2 + 36x + 170$
 $y = 2(x^2 + 18x + 81) + 170 - 162$
 $y = 2(x+9)^2 + 8$

5) $y = x^2 - 12x + 46$
 $y = (x^2 - 12x + 36) - 36 + 46$
 $y = (x-6)^2 + 10$

6) $y = x^2 + 4x$
 $y = (x^2 + 4x + 4) - 4$
 $y = (x+2)^2 - 4$

7) $y = x^2 - 6x + 5$
 $y = (x^2 - 6x + 9) - 9 + 5$
 $y = (x-3)^2 - 4$

8) $y = (x+5)(x+4) = x^2 + 9x + 20$
 $(\frac{9}{2})^2 = \frac{81}{4}$
 $y = (x^2 + 9x + \frac{81}{4}) - \frac{81}{4} + 20$
 $y = (x + \frac{9}{2})^2 - \frac{1}{4}$

9) $(\frac{1}{2}(x+4))(x-7)^2$
 $y + y = \frac{2(x-7)^2}{2}$
 $y = 2(x-7)^2 - y$

10) $6x^2 + 12x + y + 13 = 0$
 $y = -6x^2 - 12x - 13$
 $y = -6(x^2 + 2x + 1) - 13 + 6$
 $y = -6(x+1)^2 - 7$

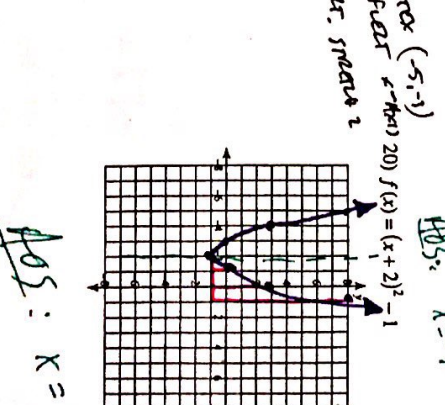
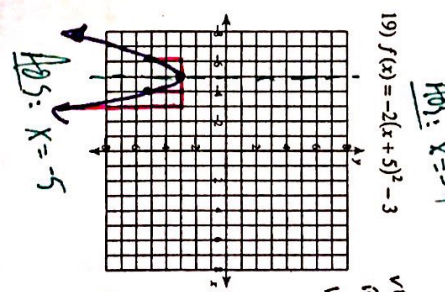
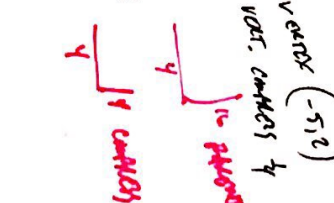
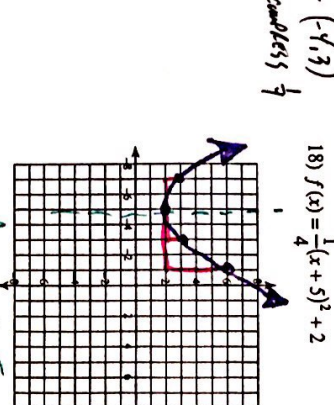
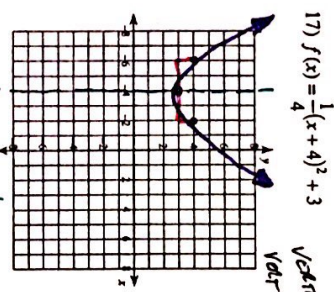
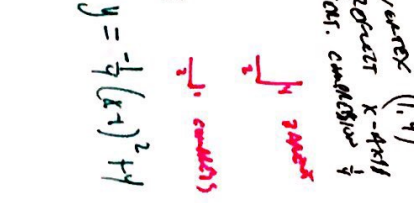
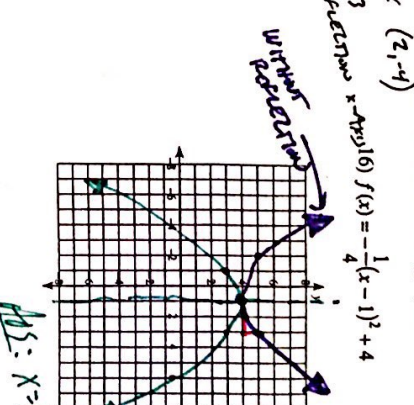
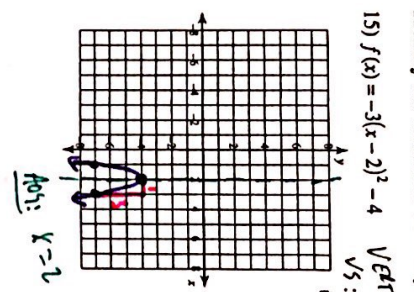
11) $162x + 731 = -y - 9x^2$
 $-9x^2 - 162x - 731 = -y$
 $9x^2 + 162x + 731 = y$
 $y = 9(x^2 + 18x + 81) - 731 + 729$
 $y = 9(x+9)^2 - 2$

12) $x^2 - 12x + y + 40 = 0$
 $y = -x^2 + 12x - 40$
 $y = -(x^2 - 12x + 36) - 40 + 36$
 $y = -(x-6)^2 - 4$

13) $y = x^2 + 10x + 33$
 $y = (x^2 + 10x + 25) - 25 + 33$
 $y = (x+5)^2 + 8$

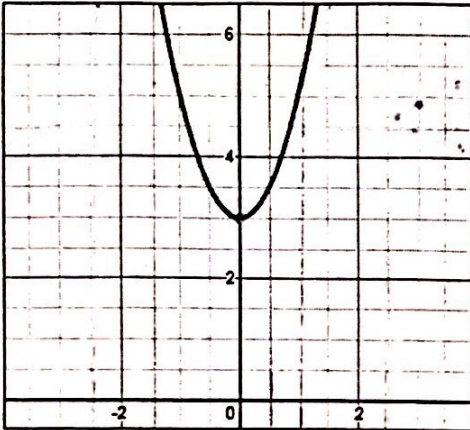
14) $y + 6 = (x+3)^2$
 $y = (x+3)^2 - 6$

Identify the vertex and axis of symmetry of each. Then sketch the graph.

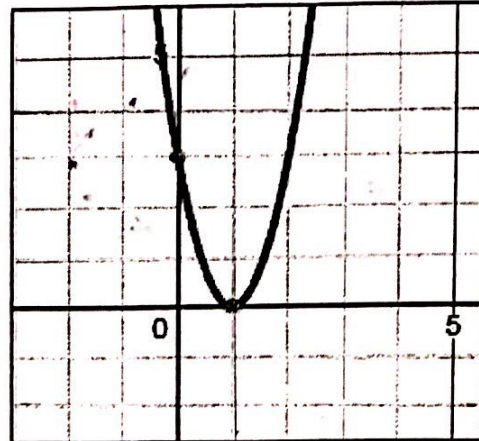


Write the equation of the graph in vertex form.

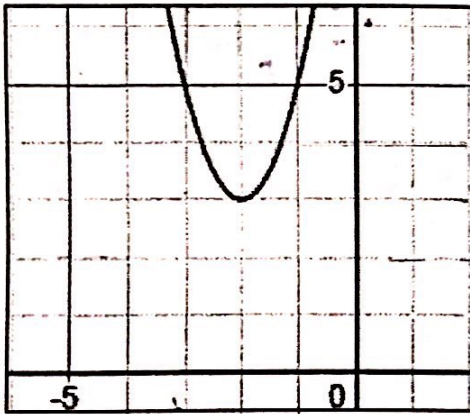
1. $y = x^2 + 3$



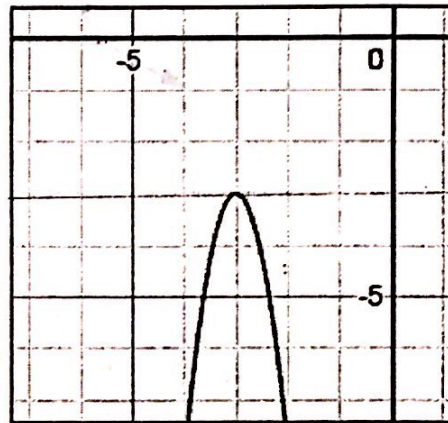
4. $y = 3(x-1)^2$



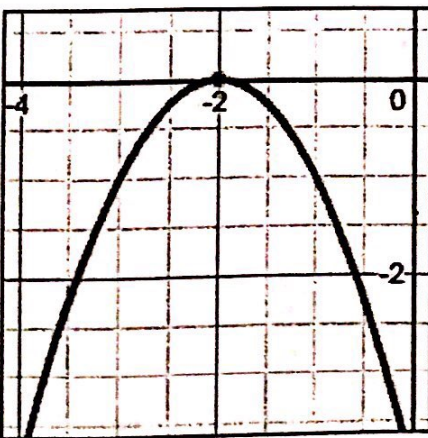
2. $y = 2(x+2)^2 + 3$



5. $y = -5(x+3)^2 - 3$



3. $y = -\frac{1}{2}(x+2)^2$



6. $y = -\frac{1}{2}(x-1)^2 - 1$

