SATPREP

Name_____

Date_____
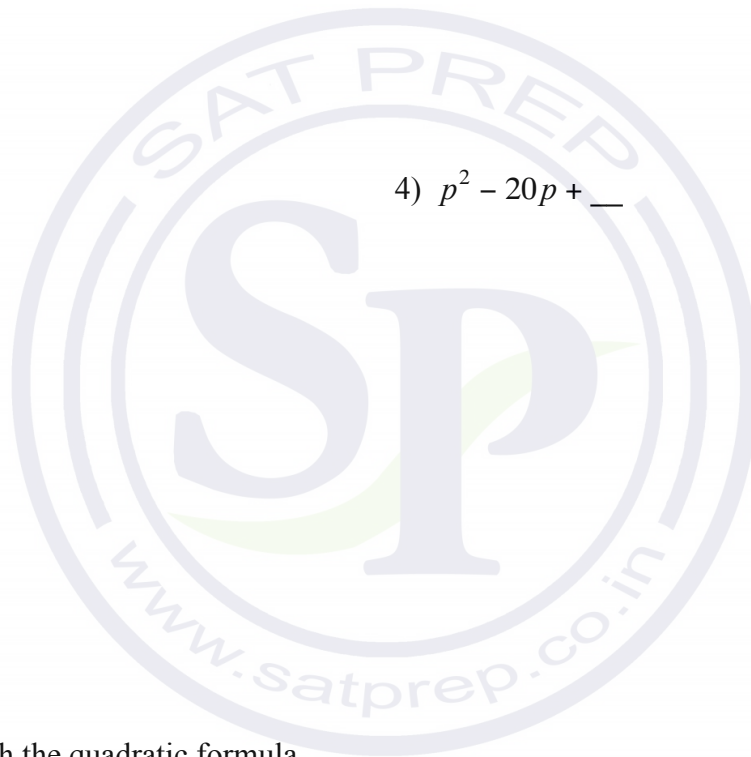
Quadratic equation and graph

Find the value that completes the square and then rewrite as a perfect square.

1) $p^2 - 5p +$ __

2) $a^2 + 20a +$ __
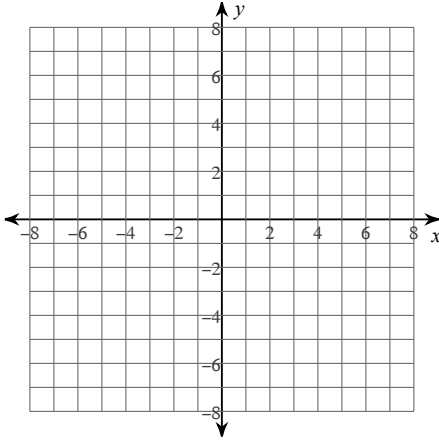
3) $m^2 - 22m +$ __

4) $p^2 - 20p +$ __

Solve each equation with the quadratic formula.
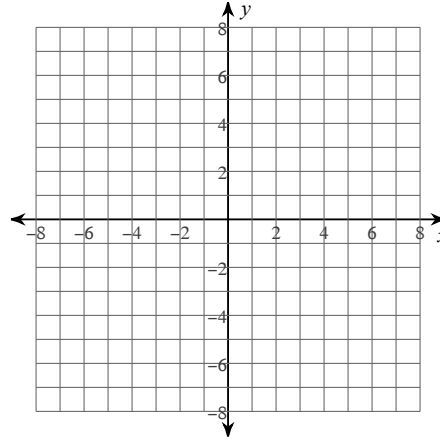
5) $3b^2 - 7b + 2 = 0$

6) $2v^2 - 18 = 0$

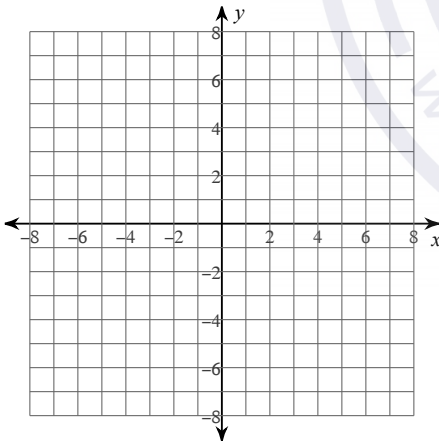Identify the vertex, axis of symmetry, and min/max value of each. Then sketch the graph.
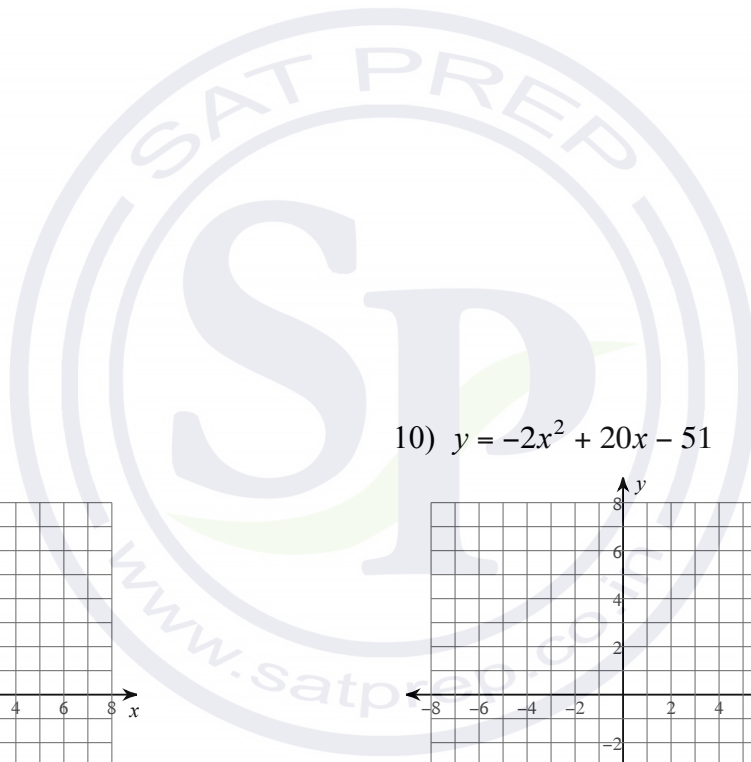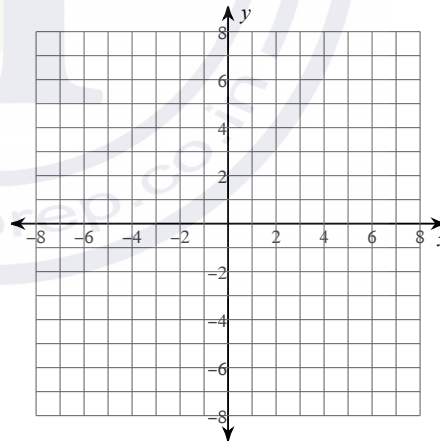
7) $y = -2x^2 - 16x - 35$

8) $y = -x^2 + 4x - 9$

9) $y = -3x^2 - 6x - 7$

10) $y = -2x^2 + 20x - 51$

Convert into complete square form and write the vertex form equation of each parabola.
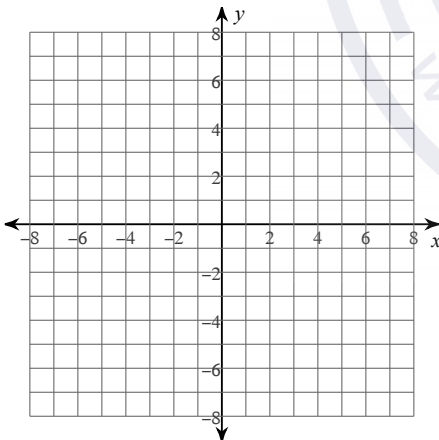
11) $y = -2x^2 + 4x - 1$
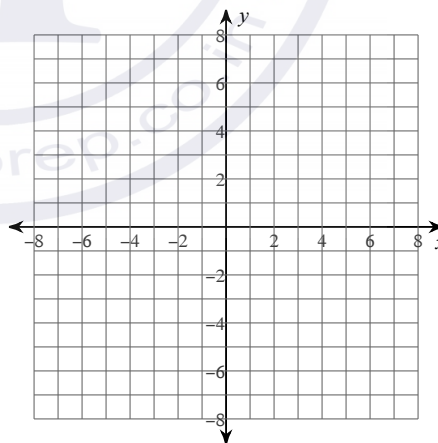
12) $y = -3x^2 - 12x - 11$

13) $y = 2x^2 + 8x + 8$

14) $y = 3x^2 - 6x - 1$

Identify the vertex, axis of symmetry, min/max value, and x-intercepts of each. Then sketch the graph.
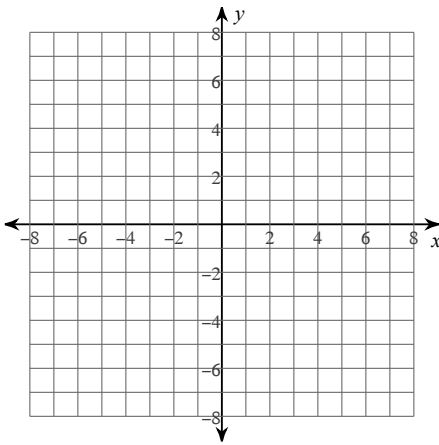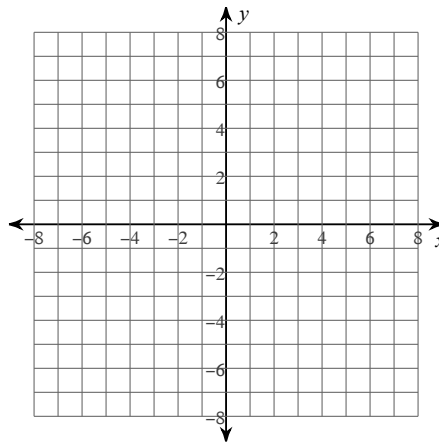
15) $y = 2(x - 1)^2 - 8$

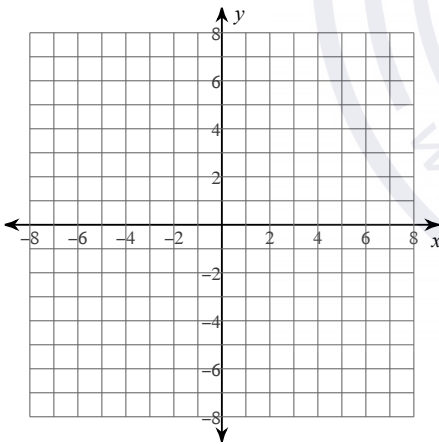16) $y = \frac{1}{4}(x - 2)^2 - \frac{9}{4}$
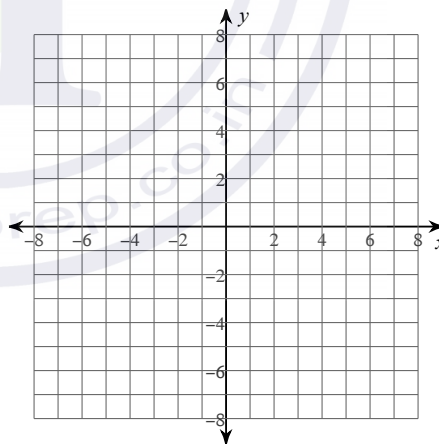
17) $y = -(x - 4)^2$

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

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

20) $y = \left(x + \dfrac{5}{2}\right)^2 - \dfrac{1}{4}$

Answers to Quadratic equation and graph

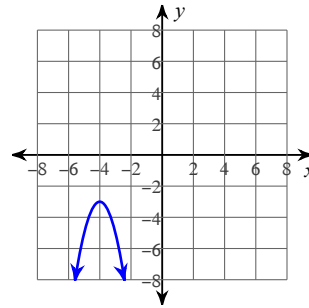1) $\dfrac{25}{4}; \left(p - \dfrac{5}{2}\right)^2$

2) $100; (a + 10)^2$

3) $121; (m - 11)^2$

4) $100; (p - 10)^2$

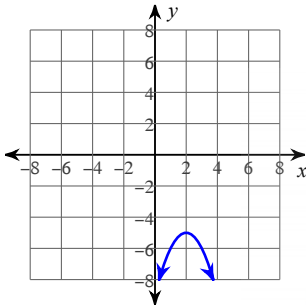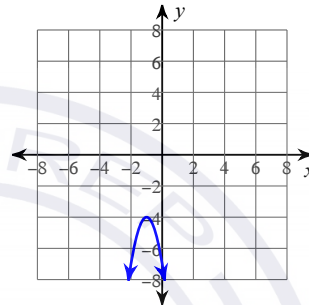5) $\left\{2, \dfrac{1}{3}\right\}$

6) $\{3, -3\}$

7)

Vertex: $(-4, -3)$
Axis of Sym.: $x = -4$
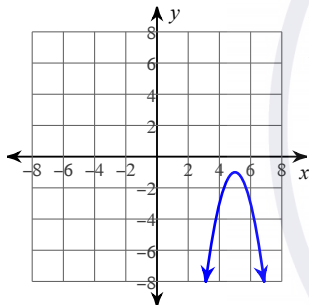Max value $= -3$

8)

Vertex: $(2, -5)$
Axis of Sym.: $x = 2$
Max value $= -5$

9)

Vertex: $(-1, -4)$
Axis of Sym.: $x = -1$
Max value $= -4$

10)

Vertex: $(5, -1)$
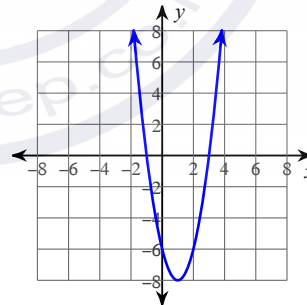Axis of Sym.: $x = 5$
Max value $= -1$

11) $y = -2(x - 1)^2 + 1$
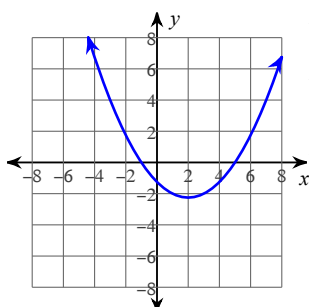
12) $y = -3(x + 2)^2 + 1$

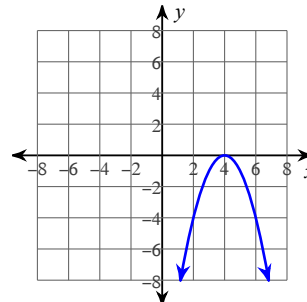13) $y = 2(x + 2)^2$

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

15)

Vertex: $(1, -8)$
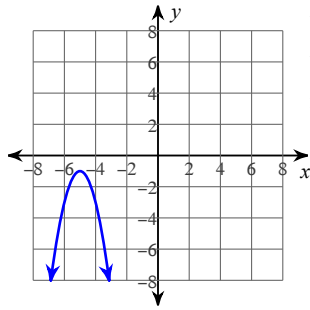Axis of Sym.: $x = 1$
Min value $= -8$
x-int: 3 and -1

16)

Vertex: $\left(2, -\dfrac{9}{4}\right)$
Axis of Sym.: $x = 2$
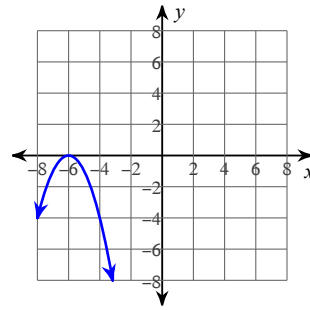Min value $= -\dfrac{9}{4}$
x-int: 5 and -1

17)

Vertex: $(4, 0)$
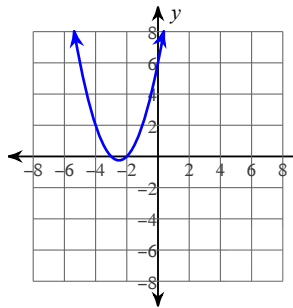Axis of Sym.: $x = 4$
Max value $= 0$
x-int: 4

18)

Vertex: $(-5, -1)$
Axis of Sym.: $x = -5$
Max value $= -1$
x-int: None

19)

Vertex: $(-6, 0)$
Axis of Sym.: $x = -6$
Max value $= 0$
x-int: -6

20)

Vertex: $\left(-\dfrac{5}{2}, -\dfrac{1}{4}\right)$

Axis of Sym.: $x = -\dfrac{5}{2}$

Min value $= -\dfrac{1}{4}$

x-int: -3 and -2