

## Algebra II Practice G.GPE.A.2 Graphing Quadratic Functions 2a

Identify the vertex, focus, and directrix of each.

1)  $y = -x^2 + 20x - 107$

A) Vertex:  $(5, -3)$

Focus:  $\left(\frac{11}{2}, -3\right)$

Directrix:  $x = \frac{9}{2}$

B) Vertex:  $(10, -7)$

Focus:  $\left(10, -\frac{29}{4}\right)$

Directrix:  $y = -\frac{27}{4}$

C) Vertex:  $(6, -2)$

Focus:  $\left(\frac{73}{12}, -2\right)$

Directrix:  $x = \frac{71}{12}$

D) Vertex:  $(10, -7)$

Focus:  $\left(\frac{39}{4}, -7\right)$

Directrix:  $x = \frac{41}{4}$

2)  $f(x) = -(x - 7)^2 - 3$

A) Vertex:  $(-3, -7)$

Focus:  $\left(-\frac{23}{8}, -7\right)$

Directrix:  $x = -\frac{25}{8}$

B) Vertex:  $(-7, 3)$

Focus:  $\left(-\frac{27}{4}, 3\right)$

Directrix:  $x = -\frac{29}{4}$

C) Vertex:  $(7, -3)$

Focus:  $\left(7, -\frac{13}{4}\right)$

Directrix:  $y = -\frac{11}{4}$

D) Vertex:  $(5, -4)$

Focus:  $\left(5, -\frac{15}{4}\right)$

Directrix:  $y = -\frac{17}{4}$

$$3) y = -(x - 9)(x - 4)$$

A) Vertex:  $\left(-\frac{11}{2}, \frac{81}{4}\right)$

Focus:  $\left(-\frac{11}{2}, \frac{41}{2}\right)$

Directrix:  $y = 20$

B) Vertex:  $\left(-\frac{81}{4}, -\frac{11}{2}\right)$

Focus:  $\left(-\frac{81}{4}, -\frac{23}{4}\right)$

Directrix:  $y = -\frac{21}{4}$

C) Vertex:  $\left(\frac{13}{2}, \frac{25}{4}\right)$

Focus:  $\left(\frac{13}{2}, 6\right)$

Directrix:  $y = \frac{13}{2}$

D) Vertex:  $\left(\frac{11}{2}, -\frac{81}{4}\right)$

Focus:  $\left(\frac{21}{4}, -\frac{81}{4}\right)$

Directrix:  $x = \frac{23}{4}$

$$5) -x^2 - 12x + y - 38 = 0$$

A) Vertex:  $(-6, 2)$

Focus:  $\left(-\frac{23}{4}, 2\right)$

Directrix:  $x = -\frac{25}{4}$

B) Vertex:  $(-6, 2)$

Focus:  $\left(-6, \frac{7}{4}\right)$

Directrix:  $y = \frac{9}{4}$

C) Vertex:  $(-6, 2)$

Focus:  $\left(-6, \frac{9}{4}\right)$

Directrix:  $y = \frac{7}{4}$

D) Vertex:  $(-6, 2)$

Focus:  $\left(-\frac{25}{4}, 2\right)$

Directrix:  $x = -\frac{23}{4}$

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

A) Vertex:  $(-8, 8)$

Focus:  $\left(-\frac{33}{4}, 8\right)$

Directrix:  $x = -\frac{31}{4}$

B) Vertex:  $(8, -8)$

Focus:  $\left(\frac{33}{4}, -8\right)$

Directrix:  $x = \frac{31}{4}$

C) Vertex:  $(8, -8)$

Focus:  $\left(8, -\frac{33}{4}\right)$

Directrix:  $y = -\frac{31}{4}$

D) Vertex:  $(-8, 8)$

Focus:  $\left(-8, \frac{31}{4}\right)$

Directrix:  $y = \frac{33}{4}$

$$6) x^2 + 10x + y + 29 = 0$$

A) Vertex:  $(-4, 5)$

Focus:  $\left(-\frac{17}{4}, 5\right)$

Directrix:  $x = -\frac{15}{4}$

B) Vertex:  $(-4, 5)$

Focus:  $\left(-4, \frac{19}{4}\right)$

Directrix:  $y = \frac{21}{4}$

C) Vertex:  $(-5, -4)$

Focus:  $\left(-\frac{21}{4}, -4\right)$

Directrix:  $x = -\frac{19}{4}$

D) Vertex:  $(-5, -4)$

Focus:  $\left(-5, -\frac{17}{4}\right)$

Directrix:  $y = -\frac{15}{4}$

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Directrix:  $y = -\frac{21}{4}$

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Focus:  $\left(\frac{13}{2}, 6\right)$

Directrix:  $y = \frac{13}{2}$

D) Vertex:  $\left(\frac{11}{2}, -\frac{81}{4}\right)$

Focus:  $\left(\frac{21}{4}, -\frac{81}{4}\right)$

Directrix:  $x = \frac{23}{4}$

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