Worksheet

08/08/2020

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Problem quickname: 9004

1)

Determine the vertex of the quadratic function. In order to do this, complete the square.

a) Function: $x^2 + 8x + 7$
Complete the square: $\square x^2 + \square x + \square - \square + \square$
Form square: $\square(x + \square)^2 - \square + \square$
Convert to vertex form: $\square(x + \square)^2 - \square$
Vertex: $(\square | \square)$

b) Function: $x^2 + 18x + 89$
Complete the square: $\square x^2 + \square x + \square - \square + \square$
Form square: $\square(x + \square)^2 - \square + \square$
Convert to vertex form: $\square(x + \square)^2 + \square$
Vertex: $(\square | \square)$

c) Function: $x^2 + 2x - 3$
Complete the square: $\square x^2 + \square x + \square - \square - \square$
Form square: $\square(x + \square)^2 - \square - \square$
Convert to vertex form: $\square(x + \square)^2 - \square$
Vertex: $(\square | \square)$

2)

Determine the vertex of the quadratic function. In order to do this, complete the square.

a) Function: $5x^2 - 80x + 312$
b) Function: $9x^2 + 108x + 320$
c) Function: $7x^2 - 126x + 574$
d) Function: $2x^2 + 32x + 118$
e) Function: $8x^2 + 16x + 6$
f) Function: $5x^2 + 40x + 89$

3)

Determine the vertex of the quadratic function.

a) Function: $7x^2 + 84x + 248$
Factor out the leading coefficient 7: $\square(x^2 + \square x) + \square$
Complete the square: $\square(x^2 + \square x + \square - \square) + \square$
Form square: $\square((x + \square)^2 - \square) + \square$
Multiply out: $\square(x + \square)^2 - \square + \square$
Convert to vertex form: $\square(x + \square)^2 - \square$
Vertex: $(\square | \square)$

b) Function: $2x^2 + 16x + 34$
Factor out the leading coefficient 2: $\square(x^2 + \square x) + \square$
Complete the square: $\square(x^2 + \square x + \square - \square) + \square$
Form square: $\square((x + \square)^2 - \square) + \square$
Multiply out: $\square(x + \square)^2 - \square + \square$
Convert to vertex form: $\square(x + \square)^2 + \square$
Vertex: $(\square|\square)$

c) Function: $5x^2 + 60x + 178$
Factor out the leading coefficient 5: $\square(x^2 + \square x) + \square$
Complete the square: $\square(x^2 + \square x + \square - \square) + \square$
Form square: $\square((x + \square)^2 - \square) + \square$
Multiply out: $\square(x + \square)^2 - \square + \square$
Convert to vertex form: $\square(x + \square)^2 - \square$
Vertex: $(\square|\square)$

d) Function: $8x^2 + 80x + 199$
Factor out the leading coefficient 8: $\square(x^2 + \square x) + \square$
Complete the square: $\square(x^2 + \square x + \square - \square) + \square$
Form square: $\square((x + \square)^2 - \square) + \square$
Multiply out: $\square(x + \square)^2 - \square + \square$
Convert to vertex form: $\square(x + \square)^2 - \square$
Vertex: $(\square|\square)$

e) Function: $7x^2 + 42x + 71$
Factor out the leading coefficient 7: $\square(x^2 + \square x) + \square$
Complete the square: $\square(x^2 + \square x + \square - \square) + \square$
Form square: $\square((x + \square)^2 - \square) + \square$
Multiply out: $\square(x + \square)^2 - \square + \square$
Convert to vertex form: $\square(x + \square)^2 + \square$
Vertex: $(\square|\square)$

f) Function: $9x^2 + 72x + 147$
Factor out the leading coefficient 9: $\square(x^2 + \square x) + \square$
Complete the square: $\square(x^2 + \square x + \square - \square) + \square$
Form square: $\square((x + \square)^2 - \square) + \square$
Multiply out: $\square(x + \square)^2 - \square + \square$
Convert to vertex form: $\square(x + \square)^2 + \square$
Vertex: $(\square|\square)$

4)

Determine the vertex of the quadratic function. In order to do this, complete the square.

a) Function: $x^2 - 10x + 18$, Vertex:
b) Function: $x^2 - 4x - 2$, Vertex:
c) Function: $x^2 + 18x + 83$, Vertex:
d) Function: $x^2 + 14x + 41$, Vertex:
e) Function: $x^2 - 6x + 15$, Vertex:
f) Function: $x^2 + 20x + 108$, Vertex:

Good Luck!