Mid-Unit 1 Skills Practice: Quadratics

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| **Example**Factor.$$-9x^{2}-6x+6x+4$$ | 1. Factor. $2x^{2}+8x-3x-12$
 | 1. Factor. $7x^{2}+14x+5x+10$
 |
| 1. Factor. $-6x^{2}+15x+4x-10$
 | 1. Factor. $8x^{2}-2x+4x-1$
 |
| **Example**Factor.$4x^{2}-8x+$3*First, split -8x into two numbers that multiply to equal the first (+4) times the last (+3), and also add up to -8x*$$4x^{2}\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_\\_+3$$ | 1. Factor. $x^{2}+11x+30$
 | 1. Factor. $-4x^{2}-9x+9$
 |
| 1. Factor. $5x^{2}+12x+4$
 | 1. Factor. $-3x^{2}+22x-7$
 |
| **Example**Fill in the first and second differences, and identify the function as either linear or quadratic.

|  |  |  |  |
| --- | --- | --- | --- |
| $$x$$ | $$y$$ |  |  |
| -2 | 4.3 | 1st |  |
|  | 2nd |
| -1 | 11.4 |  |
|  |
| 0 | 15.5 |  |
|  |
| 1 | 16.6 |  |
|  |
| 2 | 14.5 |  |
|  |

Function type: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | 1. Fill in the first and second differences, and identify the function as either linear or quadratic.

|  |  |  |  |
| --- | --- | --- | --- |
| $$x$$ | $$y$$ |  |  |
| -2 | 9 | 1st |  |
|  | 2nd |
| -1 | 8 |  |
|  |
| 0 | 5 |  |
|  |
| 1 | 0 |  |
|  |
| 2 | -7 |  |
|  |

Function type: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | 1. Fill in the first and second differences, and identify the function as either linear or quadratic.

|  |  |  |  |
| --- | --- | --- | --- |
| $$x$$ | $$y$$ |  |  |
| -2 | -6 | 1st |  |
|  | 2nd |
| -1 | -10.4 |  |
|  |
| 0 | -14.8 |  |
|  |
| 1 | -19.2 |  |
|  |
| 2 | -23.6 |  |
|  |

Function type: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **Example**Fill in the first and second differences, and identify the function as either linear or quadratic.

|  |  |  |  |
| --- | --- | --- | --- |
| $$x$$ | $$y$$ |  |  |
| -2 | 11.5 | 1st |  |
|  | 2nd |
| -1 | 9 |  |
|  |
| 0 | 6.5 |  |
|  |
| 1 | 4 |  |
|  |
| 2 | 1.5 |  |
|  |

Function type: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | 1. Fill in the first and second differences, and identify the function as either linear or quadratic.

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| --- | --- | --- | --- |
| $$x$$ | $$y$$ |  |  |
| -2 | 2 | 1st |  |
|  | 2nd |
| -1 | -1 |  |
|  |
| 0 | 1 |  |
|  |
| 1 | 8 |  |
|  |
| 2 | 20 |  |
|  |

Function type: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | 1. Fill in the first and second differences, and identify the function as either linear or quadratic.

|  |  |  |  |
| --- | --- | --- | --- |
| $$x$$ | $$y$$ |  |  |
| -2 | -11.3 | 1st |  |
|  | 2nd |
| -1 | -10.3 |  |
|  |
| 0 | -1.3 |  |
|  |
| 1 | 16.3 |  |
|  |
| 2 | 41.3 |  |
|  |

Function type: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **Example**$$f\left(x\right)=x^{2}-8x-9$$The axis of symmetry is $x=4$Determine the vertex. | 1. $f\left(x\right)=x^{2}+6x+2$

The axis of symmetry is $x=-3$Determine the vertex. | 1. $f\left(x\right)=-x^{2}+4x+32$

The axis of symmetry is $x=2$Determine the vertex. |
| 1. $f\left(x\right)=x^{2}-12x+4$

The axis of symmetry is $x=6$Determine the vertex. | 1. $f\left(x\right)=x^{2}-2x-1$

The axis of symmetry is $x=1$Determine the vertex. |
| **Example**$$f\left(x\right)=-x^{2}-8x-5$$The axis of symmetry is $x=-4$Determine the vertex. | 1. $f\left(x\right)=-x^{2}+20x-31$

The axis of symmetry is $x=10$Determine the vertex. | 1. $f\left(x\right)=-x^{2}-4x+6$

The axis of symmetry is $x=-2$Determine the vertex. |
| 1. $f\left(x\right)=-x^{2}+12x+3$

The axis of symmetry is $x=6$Determine the vertex. | 1. $f\left(x\right)=x^{2}+8x-9$

The axis of symmetry is $x=-4$Determine the vertex. |
| **Example**a.) Write the quadratic in factored form.b.) Identify whether the parabola opens upward or downward. c.)Identify the *x*-intercepts.$$f\left(x\right)=x^{2}+x-6$$ | 1. a.) Write the quadratic in factored form.

b.) Identify whether the parabola opens upward or downward. c.)Identify the *x*-intercepts.$$g\left(x\right)=-x^{2}-4x+5$$ | 1. a.) Write the quadratic in factored form.

b.) Identify whether the parabola opens upward or downward. c.)Identify the *x*-intercepts.$$h\left(x\right)=x^{2}+10x+16$$ |
| **Example**a.) Write the quadratic in factored form.b.) Identify whether the parabola opens upward or downward. c.)Identify the *x*-intercepts.$$k\left(x\right)=-x^{2}+9$$ | 1. a.) Write the quadratic in factored form.

b.) Identify whether the parabola opens upward or downward. c.)Identify the *x*-intercepts.$$m\left(x\right)=x^{2}-25$$ | 1. a.) Write the quadratic in factored form.

b.) Identify whether the parabola opens upward or downward. c.)Identify the *x*-intercepts.$$n\left(x\right)=-x^{2}+8x-15$$ |
| **Example**

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|  |
| Domain: |  |
| Range: |  |
| Zeros: |  |
| Intervals  Increase: |  |
|  Decrease: |  |
| *x*-intercept: |  |
| *y*-intercept: |  |

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| Domain: |  |
| Range: |  |
| Zeros: |  |
| Intervals  Increase: |  |
|  Decrease: |  |
| *x*-intercept: |  |
| *y*-intercept: |  |

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| Domain: |  |
| Range: |  |
| Zeros: |  |
| Intervals  Increase: |  |
|  Decrease: |  |
| *x*-intercept: |  |
| *y*-intercept: |  |

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| **Example**

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| Domain: |  |
| Range: |  |
| Zeros: |  |
| Intervals  Increase: |  |
|  Decrease: |  |
| *x*-intercept: |  |
| *y*-intercept: |  |

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| Domain: |  |
| Range: |  |
| Zeros: |  |
| Intervals  Increase: |  |
|  Decrease: |  |
| *x*-intercept: |  |
| *y*-intercept: |  |

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| Domain: |  |
| Range: |  |
| Zeros: |  |
| Intervals  Increase: |  |
|  Decrease: |  |
| *x*-intercept: |  |
| *y*-intercept: |  |

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| **Example**$$f\left(x\right)=x^{2}+2x-3$$a.) Determine and plot the *y*-interceptb.) Write the function in factored form.c.) Determine and plot the *x*-interceptsd.) Determine the axis of symmetrye.) Determine the vertexf.) Graph the vertexg.) Graph the curve. | $$g\left(x\right)=x^{2}-4x+3$$a.) Determine and plot the *y*-interceptb.) Write the function in factored form.c.) Determine and plot the *x*-interceptsd.) Determine the axis of symmetrye.) Determine the vertexf.) Graph the vertexg.) Graph the curve. | $$h\left(x\right)=-x^{2}+4x$$a.) Determine and plot the *y*-interceptb.) Write the function in factored form.c.) Determine and plot the *x*-interceptsd.) Determine the axis of symmetrye.) Determine the vertexf.) Graph the vertexg.) Graph the curve. |
| **Example**$$k\left(x\right)=-3x^{2}+3$$a.) Determine and plot the *y*-interceptb.) Write the function in factored form.c.) Determine and plot the *x*-interceptsd.) Determine the axis of symmetrye.) Determine the vertexf.) Graph the vertexg.) Graph the curve. | $$m\left(x\right)=2x^{2}-8x+6$$a.) Determine and plot the *y*-interceptb.) Write the function in factored form.c.) Determine and plot the *x*-interceptsd.) Determine the axis of symmetrye.) Determine the vertexf.) Graph the vertexg.) Graph the curve. | $$n\left(x\right)=x^{2}-4$$a.) Determine and plot the *y*-interceptb.) Write the function in factored form.c.) Determine and plot the *x*-interceptsd.) Determine the axis of symmetrye.) Determine the vertexf.) Graph the vertexg.) Graph the curve. |