|  |  |  |
| --- | --- | --- |
| **Steps** | **Example #1**  **y = -2x2 – 4x + 3** | **Example #2**  **y = - 5x2 + 20x + 1** |
| **Common factor** the coefficient of the x2 term from the first two terms. **Do** **not** factor out the x. |  |  |
| **Divide** the coefficient of x by 2, and then **square** it. |  |  |
| **Add** and **subtract** that value inside the bracket of the equation two steps above. |  |  |
| Move the last term in the bracket to the outside of the bracket and **multiply** it with the number in front of the bracket. Add the two constants together. |  |  |
| Factor the perfect square trinomial inside the bracket. |  |  |

**Practice:**

1. Convert the following quadratic relations into vertex form:

a)  b) 

2. Determine the coordinates of the vertex of each parabola.

a)  b) c)

3. Graph each parabola by determining:

i) its direction of opening and the y-intercept (from the standard form)

ii) the coordinates of the vertex (by completing the square to obtain the vertex form)

iii) the x-intercepts (factor or use the quadratic formula to solve the equation 

|  |  |
| --- | --- |
|  | a)  b)  c) |

4. A ball is kicked into the air. It follows a path given by  where *t*  is the time, in seconds, and is the height, in metres.

1. Determine the maximum height of the ball to the nearest tenth of a metre.
2. When does the ball reach its maximum height?