485(8). Write the distance between the point \((1, 0)\) and a point \((x, y)\) on the curve \(y = x^3\) in terms of \(x\).

You get credit for drawing the picture indicating the variables, for listing the given facts (explicit and implicit) and for the answer.

**Picture:** Draw the picture. On the picture indicate your variables.

\[
d = \sqrt{(x - 1)^2 + (y - 0)^2}
\]

\[
y = x^3
\]

**Answer:**

Want \(d\) in \(y\).

Have \(d\) in \(x\) and \(y\).

Need \(y\) in \(x\) (see given).

\[
y = x^3
\]

\[
d = \sqrt{(x - 1)^2 + y^2}
\]

\[
= \sqrt{(x^2 - 2x + 1) + (x^3)^2}
\]

\[
= \sqrt{x^6 + x^2 - 2x + 1}
\]

3(8). \(y = x^2 - 2x - 15\). Write in completed-square form.

Find the vertex, intercepts, graph.

The vertex must be an order pair with ()'s, e.g., \((3, 4)\) not just \(3, 4\).

The completed-square form must be \(y = a(x - b)^2 + c\) not, for example, \(4(x + 3)^2 - 3\).

\[
(x^2 - 2x + 1) - 15 - 1
\]

\[
y = (x - 1)^2 + (-16)
\]

\[\text{vertex} = (1, -16)\]

\[\text{x-intercepts} = -3, 5\]

\[\text{y-intercept} = -15\]

**completed square:**

\[
(y = a(x - b)^2 + c
\]

Draw the graph.