Quiz 6 Solutions

Problem 1. Find the coordinates of the vertex given by $y = x^2 - 6x + 5$

Solution:

Direct computation:

\[
y = x^2 - 6x + 5 \\
= x^2 - 6x + 9 - 9 + 5 \\
= (x - 3)^2 - 4
\]

So vertex is at $\{(3, -4)\}$

Problem 2. Does the parabola given by $y = x^2 + 4$ intersect the $x$-axis?

Solution:

If a parabola intersects the $x$-axis, that is equivalent to having at least one real root. So by calculation,

\[
0 = x^2 + 4 \\
-4 = x^2 \\
\pm 2i = x
\]

So we will have imaginary roots, so this parabola does not intersect the $x$-axis.