① $f(x) = -3x + 1$

x-int

$0 = -3x + 1$

$-1 = -3x$

$\boxed{x = \frac{1}{3}}$

y-int

$y = -3(0) + 1$

$\boxed{y = 1}$

② $f(x) = x^2 - 2x$

x-int

$0 = x^2 - 2x$

$0 = x(x-2)$

$x = 0 \quad x - 2 = 0$

$\boxed{x = 0, 2}$

y-int

$y = 0^2 - 2(0)$

$\boxed{y = 0}$

③ $f(x) = x^3 + 3$

x-int:

$0 = x^3 + 3$

$x^3 = -3$

$\boxed{x = \sqrt[3]{-3}}$

y-int

$y = 0^3 + 3$

$\boxed{y = 3}$

④ $f(x) = \sqrt{x-3}$

x-int

$0^2 = \left(\sqrt{x-3}\right)^2$

$x - 3 = 0$

$\boxed{x = 3}$

y-int

$y = \sqrt{0-3}$

$y = \sqrt{-3}$

$\boxed{\text{dne}}$

⑤ $f(x) = |x-6|$

x-int

$0 = |x-6|$

$x - 6 = 0$

$\boxed{x = 6}$

y-int

$y = |0-6|$

$y = |-6|$

$\boxed{y = 6}$

⑥ $x = y^2 + 1$

x-int

$x = 0^2 + 1$

$\boxed{x = 1}$

y-int

$0 = y^2 + 1$

$\sqrt{y^2} = \sqrt{-1}$

$\boxed{\text{dne}}$

⑦ $f(x) = -(x+7)^2 - 12$

x-int

$0 = -(x+7)^2 - 12$

$\frac{12}{-1} = \frac{-(x+7)^2}{-1}$

$\sqrt{-12} = \sqrt{(x+7)^2}$

$\boxed{\text{dne}}$

y-int

$y = -(0+7)^2 - 12$

$y = -49 - 12$

$\boxed{y = -61}$