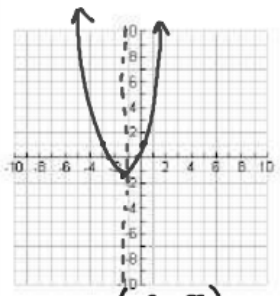
Vertex
A.O.S
X-intercepts
Y-intercept

Domain Range
Inevals of Inc/Dec

$f(x) = x^2 + 3x + 1$



$V\left(-\frac{3}{2}, -\frac{5}{4}\right)$ $(-1.5, -1.25)$

A.O.S $x = \frac{-b}{2a} = -\frac{3}{2}$

X-intercepts $\frac{-b}{2a} \pm \frac{\sqrt{b^2-4ac}}{2a}$

$x^2+3x+1=0$ $\frac{-3}{2(1)} \pm \frac{\sqrt{3^2-4(1)(1)}}{2(1)}$

Y-intercept $(0,1)$ $-\frac{3}{2} \pm \frac{\sqrt{5}}{2}$ $\approx -.4$ ≈ -2.6

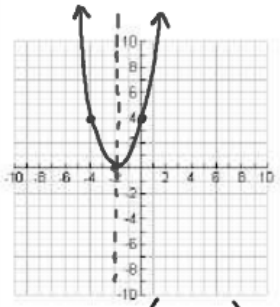
Dec $(-\infty, -1.5)$

Inc $(-1.5, \infty)$

Domain $(-\infty, \infty)$

Range $[-1.25, \infty)$

$f(x) = x^2 + 4x + 4$



Vertex $x = \frac{-b}{2a} = \frac{-4}{2(1)} = -2$

$f(-2) = (-2)^2 + 4(-2) + 4$ $V(-2, 0)$

$4 - 8 + 4 = 0$

A.O.S. $x = -2$

Y-intercept $(0, 4)$

Domain $(-\infty, \infty)$

Range $[0, \infty)$

Inc $(-2, \infty)$

Dec $(-\infty, -2)$

X-intercepts

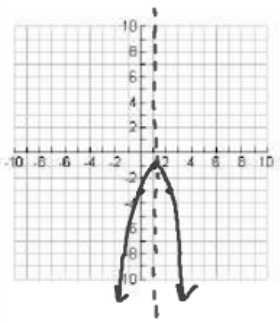
$x^2+4x+4=0$

$(x+2)(x+2)=0$

$x+2=0$ $x+2=0$

$x=-2$ $x=-2$

$f(x) = -2x^2 + 4x - 3$



Vertex: $x = \frac{-b}{2a} = \frac{-4}{2(-2)} = 1$ $(1, -1)$

$f(1) = -2(1)^2 + 4(1) - 3$

$= -2 + 4 - 3$

$= -1$

A.O.S. $x = 1$

Domain $(-\infty, \infty)$

Range $(-\infty, -1]$

Inc $(-\infty, 1)$

Dec $(1, \infty)$

$-2x^2+4x-3=0$

$\frac{-b}{2a} \pm \frac{\sqrt{b^2-4ac}}{2a}$

$\frac{-4}{2(-2)} \pm \frac{\sqrt{4^2-4(-2)(-3)}}{2(-2)}$

$1 \pm \frac{\sqrt{16-24}}{-4}$

None