NOV 17

2 forms

1. $y = ax^2 + bx + c$ OR $f(x) = ax^2 + bx + c$
2. $y - k = (x-h)^2$ where (h,k) is the turning point

Find x, y intercepts of parabolas

$y + 6 = (x+1)^2$

y-int (sub $x=0$)

$y + 6 = (0+1)^2$

$y + 6 = (1)^2$

$y = -5$

$(0, -5)$

x-int (sub $y=0$)

$(0) + 6 = (x+1)^2$

$\sqrt{6} = \sqrt{(x+1)^2}$

$\pm\sqrt{6} = x + 1$

$-1 \pm \sqrt{6} = x$

$(-1+\sqrt{6}, 0)$ $(-1-\sqrt{6}, 0)$

wksh 14.

1. $f(x) = x^2 - 1$, $f(-\sqrt{3})$

$f(-\sqrt{3}) = (-\sqrt{3})^2 - 1 = 3 - 1 = 2$

$f(\sqrt{7}) = (\sqrt{7})^2 - 1 = 7 - 1 = 6$

$f(0) = (0)^2 - 1 = -1$

2. $f(x) = -2x^2 + x$, $f(-5)$

$f(-5) = -2(-5)^2 + (-5) = -50 - 5$

$-2(25) - 5 = -55$

$f(-\frac{1}{2}) = -2(-\frac{1}{2})^2 + (-\frac{1}{2})$

$-2(\frac{-1}{2})(\frac{-1}{2}) + \frac{-1}{2}$

$(\frac{-2}{1})(\frac{1}{4}) - \frac{1}{2} = -\frac{1}{2} - \frac{1}{2} = -1$

Domain:

Restrictions -

$f(x) = \frac{\text{top}}{\text{expression}}$ expression $\neq 0$

$f(x) = \sqrt{\text{expression}}$ expression ≥ 0

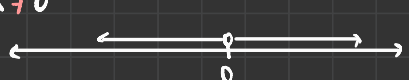
$f(x) = \frac{\text{top}}{\sqrt{\text{expression}}}$ expression > 0

$f(x) = \frac{\sqrt{\text{expression 1}} \geq 0}{\sqrt{\text{expression 2}} \neq 0}$ } intersection of these sets

Examples

$f(x) = \frac{x^2 + 3x - 7}{x}$ — only trouble

D_f: $x \neq 0$



$(-\infty, 0) \cup (0, \infty)$

$f(x) = \sqrt{18 - 3x}$ — cannot be neg.

D_f: $18 - 3x \geq 0$

$\frac{-3x}{-3} \geq \frac{-18}{-3}$

$x \leq 6$

$(-\infty, 6]$

$f(x) = \frac{\sqrt{x}}{x^2 - 4}$ — $\sqrt{x}$ non neg., denom non 0.

$x \geq 0$

$x^2 - 4 \neq 0$

$x \neq \pm 2$

from $x^2 = 4$

$x = \pm\sqrt{4}$

$[0, 2) \cup (2, \infty)$