

### 3.6 The Zeros of a Quadratic Function

Last day's work:

pp. 185-186 #1bde, 3ac, 4ac, 6, 7 [14, 17, 18]

7. For what value(s) of  $k$  will the function  $f(x) = kx^2 - 4x + k$  have no zeros?

$a=k$     $b=-4$     $c=k$   
 the condition for no zeros is

$$b^2 - 4ac < 0$$

$$(-4)^2 - 4(k)(k) < 0$$

$$16 - 4k^2 < 0$$

$$-4k^2 + 16 < 0$$

$$-4(k^2 - 4) < 0$$

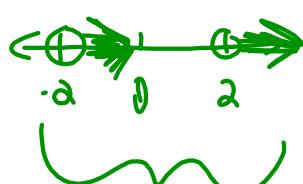
$$-4(k-2)(k+2) < 0$$

$\therefore (k-2)(k+2)$  must be positive

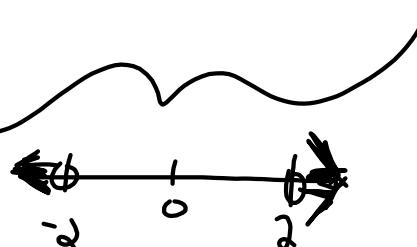
Case 1

$$k-2 > 0 \text{ AND } k+2 > 0$$

$$k > 2 \text{ and } k > -2$$



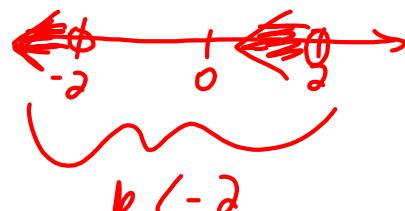
$$k > 2$$



Case 2

$$k-2 < 0 \text{ AND } k+2 < 0$$

$$k < 2 \text{ AND } k < -2$$



$$k < -2$$