Solving a quadratic inequality written in factored form

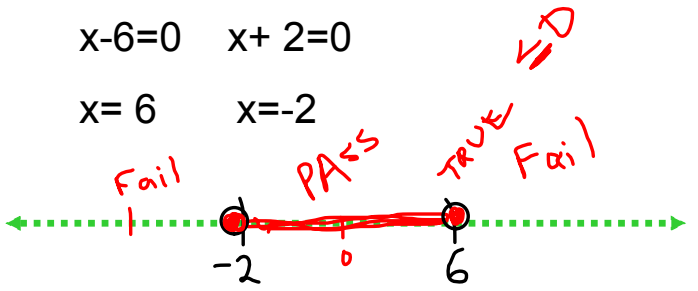
Graph the solution to the following inequality on the number line.

$(x-6)(x+2) \leq 0$

when is the quatratic part equal to zero?

x-6=0 x+ 2=0

x= 6 x=-2



[-2, 6]

find test points

~~test -3~~ F (x-6)(x+2)-> (-3-6)(-3+2)=(-9)(-1=9 ~~<~~ 0

test 0 (0-6)(0+2)=-6*2=-12 <0 PASS

test 8 (8-6)(8+2)=2*10=20>0 FAILS

1. Find the zeros
2. Identify test points
3. Check for Pass or Fail
4. Consider the zeros Pass or Fail
5. Shade number line
6. Convert interval notations

Graph the solution to the following inequality on the number line.

$$(x+4)(x-2) \geq 0$$

1. zeros -4,2
2. Test Points -5, 0, 3
3. (-5+4)(-5-2)=7 >0 ?yes PASS

   (0+4)(0 - 2)= -8>0 no FAILS

   (3+4)(3-2)=7>0 yes PASS
4. How about zeros yes!
5.

6. (-oo, -4] U [2, oo)

Graph the solution to the following inequality on the number line.

$$x^2 < 6x$$

$-6x \quad -6x$

Note that you can use the ALEKS graphing calculator to help get your answer.

same type...just get zero on one side

$x^2 - 6x < 0$

then...factor it so we can find zeros

x (x - 6) < 0

1. zeros: 0, 6
2. Test points -1, 3, 7
3. (-1)(-1-6)= -1*-7 = 7 < 0 FAILS

   3 (3 - 6) = 3 (-3) = -9 < 0 PASS

   7(7-6) = 7*1=7<0 FAILS
4. zero FAIL because 0 < 0 fails
5.

6. (0 , 6)

Graph the solution to the following inequality on the number line.

$x^2 + 6x < -8$

$+8 \quad +8$

Note that you can use the ALEKS graphing calculator to help get your answer.

$x^2 + 6x + 8 < 0$

$(x + 4)(x + 2) < 0$

1. Zeros -4, -2
2. Tst Points -5, -3, 0
3. $(-5+4)\cdot(-5+2) = 3 < 0$ FAILS

   $(-3+4)\cdot(-3+2) = -1 < 0$ PASS

   $(0+4)\cdot(0+2) = 8 \not< 0$ FAILS

4 Zeros FAIL $0 < 0$ NO

5.

6. (-4, -2)

Solve the following inequality.

$$\frac{-x-7}{x+4} < 0$$

Write your answer using interval notation.

1. Zeros (numerator + denominator):-7,-4

   $-x - 7 = 0 \qquad x + 4 = 0$

2. Test points -8, -6, 0

3. $\frac{(- -8 - 7) = 1}{-8 + 4 = -4} < 0$ PASS

   $\frac{(- -6 - 7) = -1}{(-6 + 4) = -2}$ FAILS

   $\frac{(0 - 7) = -7}{(0 + 4) = 4}$ PASS

4. -4 is ALWAYS bad because zero from denominator, -7 also FAILS

5.

6. (-oo, -7) U (-4, oo)

Solve the following inequality.

$$\frac{2}{7-x} \geq \frac{-1}{x+1} + \frac{1}{x+1}$$

Write your answer as an interval or union of intervals.
If there is no real solution, click on "No solution".

Get zero on one side

$$\frac{2}{7-x} + \frac{1}{x+1} \geq 0$$

find LCD (7-x)(x+1)

$$\frac{2(x+1)}{(7-x)(x+1)} + \frac{1(7-x)}{(x+1)(7-x)} \geq 0$$

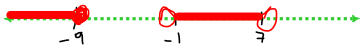
$$\frac{2x+2+7-x}{(7-x)(x+1)} \geq 0$$

$$\frac{(x+9)}{(7-x)(x+1)} \geq 0$$

1. Find Zeros -9, -1, 7
2. Test Points -10, -3, 0, 9
3. $\frac{-10+9}{(7--10)(-10+1)} = \frac{-1}{-153}$ PASS

-3.....PASS/FAIL
0.....PASS/FAIL
9.....PASS/FAIL

4. -9 pass/fail -1, 7 both FAIL make denom 0

5 

6. (-oo,-9] U (-1, 7)

5. Finding the maximum or minimum of a quadratic function

Answer the questions below about the quadratic function.

open up A=2 so MIN

$$f(x) = 2x^2 - 20x + 53$$

Does the function have a minimum or maximum value?

X Minimum ○ Maximum

Where does the minimum or maximum value occur?

$x = \frac{-B}{2A} = 20/4 = 5$

What is the function's minimum or maximum value?

f(5) = 2*25 - 20*5 + 53= 3

where, when refer to X

What refer Y value

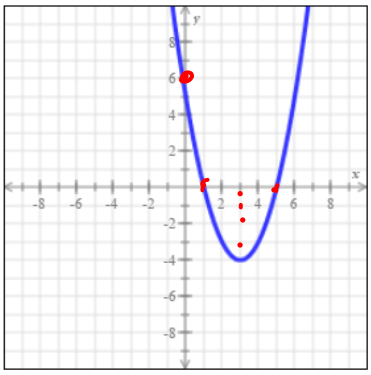
The cost C (in dollars) of manufacturing x radios at Jessica's Stereo World is given by the function $C(x)=x^2-500x+68{,}763$. What is the minimum cost of manufacturing radios? Do not round your answer.

A=1 Positive means Minimum

Where is the minimum? -B/2 = 500/2 = 250

What min? C(250)= 250^2 - 500(250) + 68763

Use the graph of the parabola to fill in the table below.



x int : 1, 5

y int : 6

(a) Does the parabola open upward or downward?

✓ upward downward

(b) Find the equation of the axis of symmetry.

equation of axis of symmetry: X = 3

(c) Find the coordinates of the vertex. (3, -4)

vertex: (,)