x-intercepts

$(r-3)(r-5)=0$ $\quad r^2-8r+15=0$

$r=3 \quad r=5$

$x=\frac{-b}{2a} = \frac{8}{2(1)} = 4$

$(4)^2-8(4)+15$

$16-32+15$

-1

$-r^2+8r \geq 15$

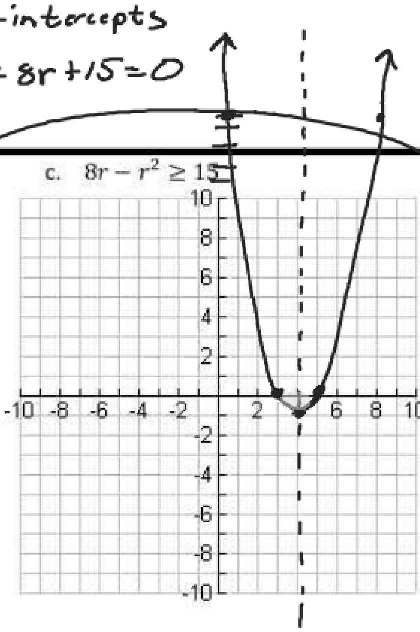
$-r^2+8r-15 \geq 0$

$r^2-8r+15 \leq 0$

X ✓ X

3 5

c. $8r - r^2 \geq 15$



$0 \geq r^2-8r+15$

$r^2-8r+15 \leq 0$

Vertex $(4,-1)$

x-intercepts $r=3$ $r=5$

y-intercept $(0,15)$

A.O.S. $x=4$

$3 \leq x \leq 5$

$[3,5]$

3 5

$x=\frac{-b}{2a}$

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

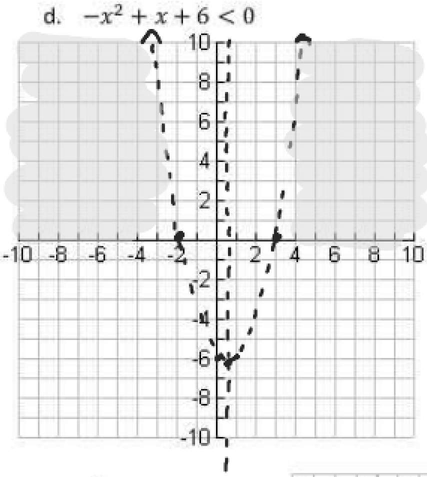
$(\frac{1}{2})^2-\frac{1}{2}-6$

$\frac{1}{4}-\frac{1}{2}-\frac{6}{1}$

$\frac{1}{4}-\frac{2}{4}-\frac{24}{4}$

$-\frac{25}{4}$

d. $-x^2+x+6<0$



$x^2-x-6>0$

$V(\frac{1}{2},\frac{-25}{4})$

$x^2-x-6=0$

$(x-3)(x+2)=0$

$x=3 \quad x=-2$

A.O.S. $x=\frac{1}{2}$

✓ X ✓

-2 3

$x<-2$ or $x>3$

$(-\infty,-2)\cup(3,\infty)$

-2 3

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

$(2)^2-4(2)+1$

$4-8+1$

-3

$V(2,-3)$

e. $x^2-4x+1 \leq 0$

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

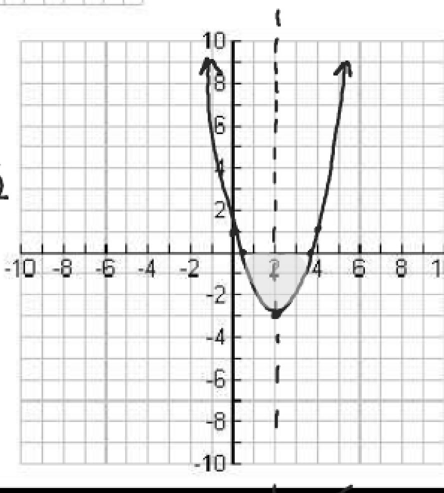
$2 \pm \frac{\sqrt{(-4)^2-4(1)(1)}}{2}$

$2 \pm \frac{\sqrt{12}}{2}$

$2+\frac{\sqrt{12}}{2} \quad 2-\frac{\sqrt{12}}{2}$

$3.73 \quad .27$

y-intercept $(0,1)$



A.O.S. $x=2$

$.27 \leq x \leq 3.73$

$[.27, 3.73]$

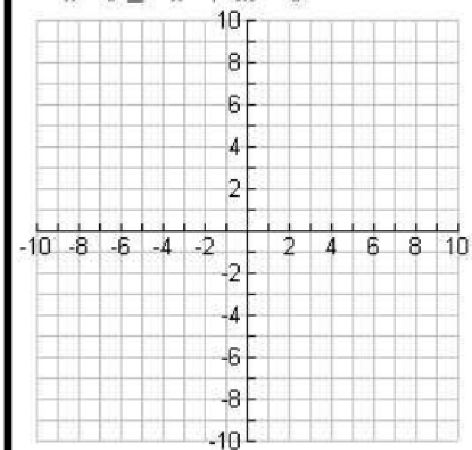
X ✓ X

.27 3.73

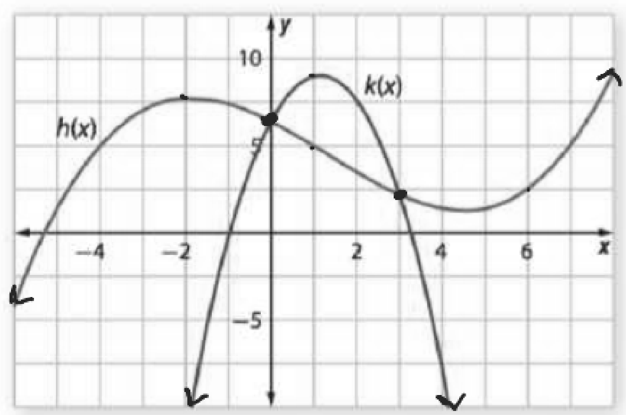
.27 3.73

Complex Inequalities

f. $0 \le -x^2 + 4x - 6$



7. The diagram below shows the graph of functions *h(x)* and *k(x)*. Assume that all points of intersection are shown and that the functions have no breaks in their graphs.



a > b

a < b

a = b

a. What are the approximate values of x for which *h(x) = k(x)?*

x = 0, 3

b. What are the values of x for which $h(x) \le k(x)$? Express your answer using symbols, interval notation, and a number line graph.

$0 \le x \le 3$

[0, 3]