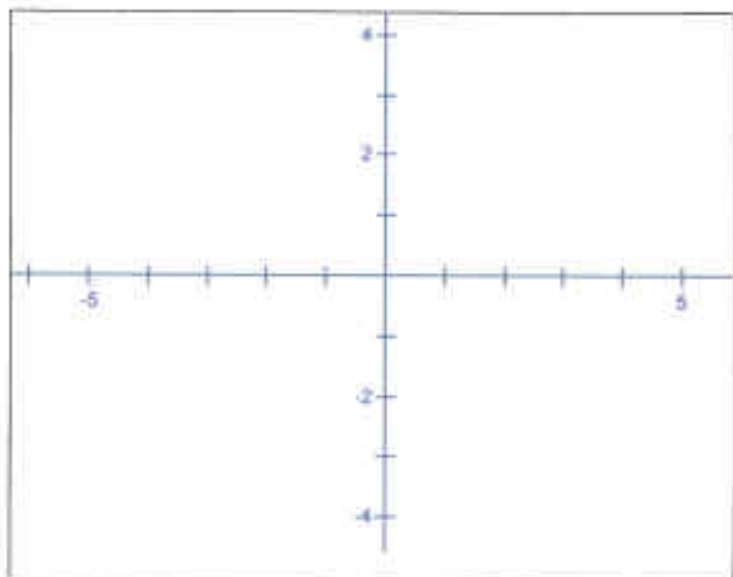


Exam #2 – Math 143
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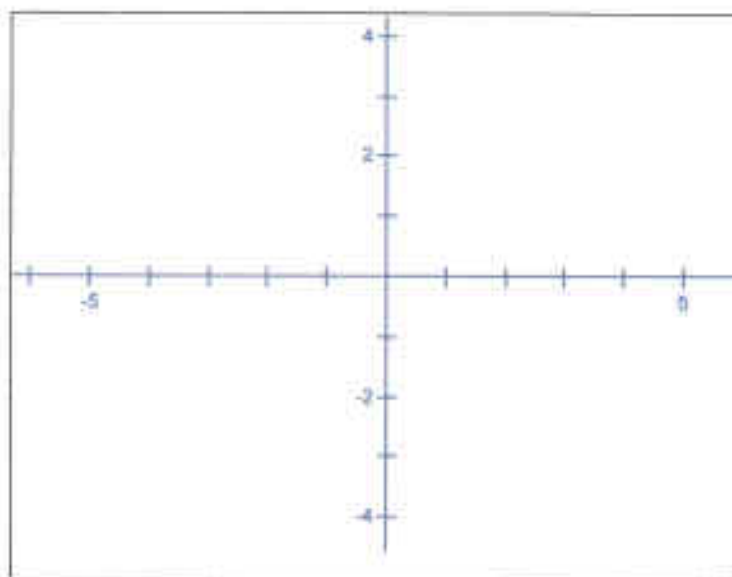
Two
These problems are to be done without calculators.

1. Graph the function $f(x) = 12x - 3x^2$. Specify the x and y intercepts and the position of the vertex.



2. Determine the x and y intercepts and the asymptotes of the function $f(x) = \frac{-x}{(x-2)(x+3)}$.

Show excluded areas on the graph below and sketch the curve.



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3. Find the equation of a line defined by $f(3) = 2$ and $f(-3) = 5$

4. *Find the equation of a line if*
The graph passes through $(7,1)$ and the x intercept is three times the y intercept.

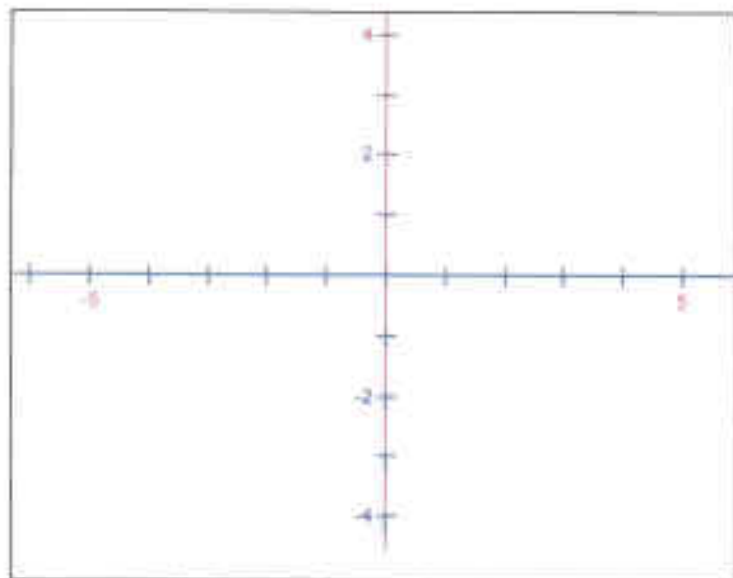
5. Find the value of x that minimizes the function $f(x) = \sqrt{x^2 - x + 1}$.

6. A piece of wire 6 m long is cut into two pieces, one of length x and the other of length $6-x$. The first piece is bent into a square and the second into a rectangle in which the length is twice the width. Express the combined area of the square and rectangle as a function of x .

7. A demand function is given as $p = 5 - \frac{x}{4}$ where p is the price and x is the number of units sold. How many units must be sold to maximize the revenue from this item.
8. An athletic field with a perimeter of $\frac{1}{2}$ mile consists of a rectangle with semicircular ends (see diagram on board). Express the area of the field as a function of r , the radius of the semicircle.

9. Which point on the curve $y = \sqrt{x}$ is closest to the point $(2,0)$?
10. What number exceeds its square by the greatest amount?

11. Carefully graph the function $f(x) = \frac{(x-3)(x+2)}{(x-2)(x+1)}$. Specify all asymptotes and intercepts.



12.