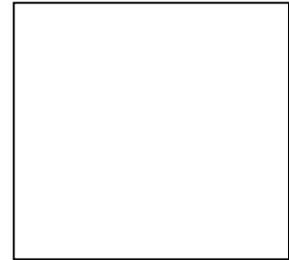NAME:_____

Place your answers in the spaces provided. You must show your work to receive credit.

(8 pts) 1. Solve the following inequality for *x*.

$$\frac{1}{4}x - \frac{1}{8} < \frac{1}{2}x + 1$$

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(8 pts) 2. Show that the triangle whose vertices are A(0,1), B(2,5) and C(6,3) is isosceles (two sides are equal in length).

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(10 pts) 3. Find the center and radius of this circle.

$$x^2 - 6x + y^2 + 10y = -30$$

center =
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radius =
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Place your answers in the spaces provided. You must show your work to receive credit.

(10 pts) 4. Find the standard equation of the parabola shown below.

(3,2)

(5,0)
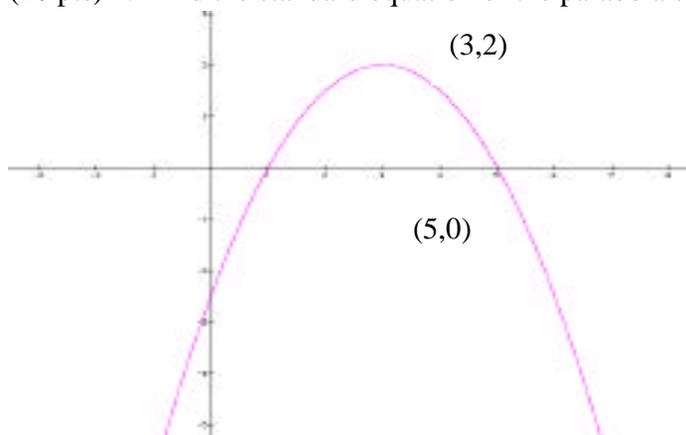
(14 pts) 5. Given $f(x) = 4 - x^2$ and $g(x) = \dfrac{1}{x}$, find and simplify each of the following.

(4 pts) (a) $f(-3)$

$f(-3) =$

(4 pts) (b) $\dfrac{1}{g(2)}$

$\dfrac{1}{g(2)} =$

(6 pts) (c) $(g \circ f)(x)$

$(g \circ f)(x)=$ [   ]
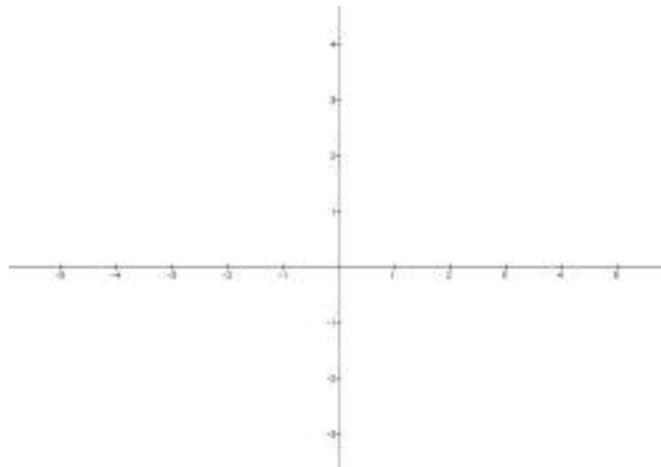
NAME:_____

Place your answers in the spaces provided. You must show your work to receive credit.

(10 pts) 6. Sketch the graph of the following polynomial on the axes provided. You must show supporting work, such as an $x|y$ table.

$$f(x) = x(x + 1)(x - 2)$$

(10 pts) 7. Given the function $f(x) = \dfrac{3 - x}{2}$, find the inverse function, $f^{-1}(x)$.

[   ]

$$f^{-1}(x) =$$

(8 pts) 8. Simplify, writing your answer without negative exponents.

$$x^{\frac{1}{2}}y^{-1} \quad \left(x^{-\frac{1}{2}}y^{\frac{2}{3}} \right)^3$$

[ ]

NAME:_____
Place your answers in the spaces provided. You must show your work to receive credit.

(12 pts) 9. Tom purchased a fishing boat for $12,500. The boat will depreciate linearly to a value of $7,700 after 6 years.

(8 pts) (a) Write a formula for the boat's value, V, in terms of t, where t is the number of years since the boat was purchased.

$V(t) =$ [ ]

(4 pts) (b) Use your equation from part (a) to find the number of years, t, since the boat was purchased when it will be worth $5,300.

$t =$ [ ]

(10 pts) 10. Morris University is losing enrollment because the tuition they charge is too high. If the enrollment is decreasing 3.5% each year and in 1997 their enrollment was 24,000 students, what will the enrollment be in the year 2005? Round your answer to the nearest whole number.