NAME ____________________ Rec. Instr. ____________________

Signature ____________________ Rec. Day/Time ____________________

College Algebra – Exam 3
April 12, 2005

Show all work for full credit. You may use a calculator, but no notes or books are allowed.

(6 pts) 1. Find all solutions of the equation $\sqrt[3]{2x-5} = 1$.

(6 pts) 2. Find all x which satisfy the inequality $|x+2| > 3$.

(6 pts) 3. Find all solutions of $\sqrt{x+1}+5=6$.

(8 pts) 4. Solve the equation $\dfrac{3x}{x+2}+\dfrac{6}{x}=\dfrac{12}{x^2+2x}$.

(6 pts) 5. Determine whether -4 is a zero of the polynomial
$f(x)=x^3+8x^2+8x-32$.

(9 pts) 6. Let $y = \dfrac{2x^2 - 3x - 1}{x^2 - x - 6}$.

(a) Find the horizontal asymptote.

(b) Find all vertical asymptotes.

(7 pts) 7. Use long division to write the improper function $\dfrac{x^2 - x - 6}{x + 2}$ as a polynomial plus a proper function.

(8 pts) 8. Find a polynomial of degree 3, having the zeros 1,2,3.

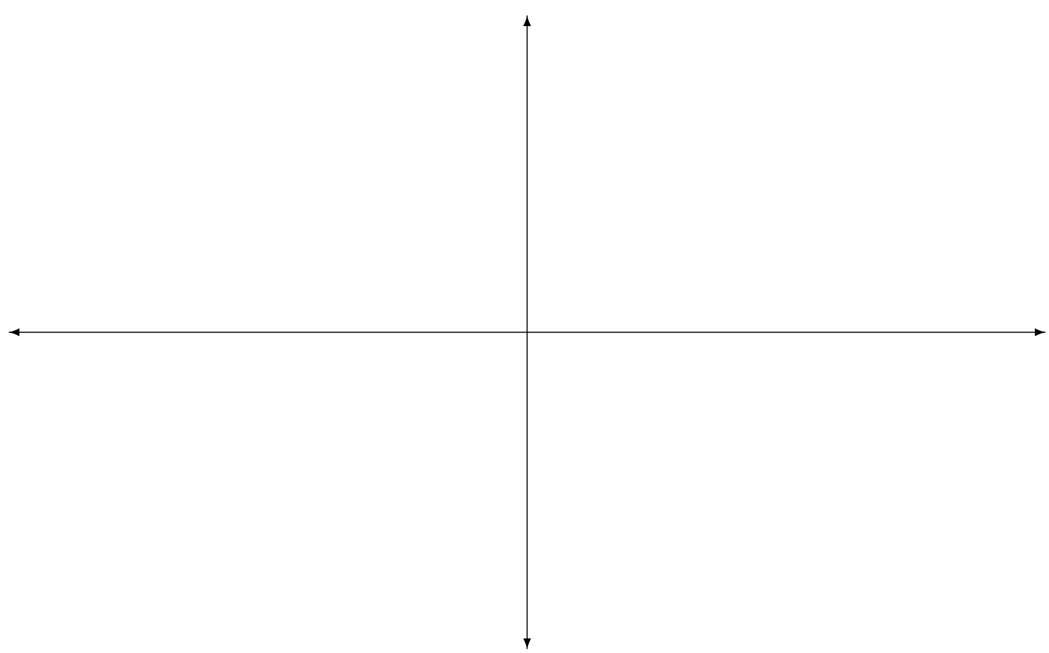
(12 pts) 9. Let $f(x) = \dfrac{x-1}{x+2}$.

(a) Find the x- and y-intercepts.

(b) Find the vertical asymptote.

(c) Find the horizontal asymptote.

(d) Graph the function. Label the intercepts and asymptotes.



(8 pts) 10. Let $P(x) = 3x^3 + 4x^2 - 6x - 4$.

Use the Rational Zero Theorem to <u>list all possible</u> rational zeros of this polynomial.

(8 pts) 11. Find the inverse function f^{-1} of $f(x) = 2x - 5$.

(16 pts) 12. Find all x which satisfy

$$\frac{x-2}{x^2+5x+6} < 0.$$