MS 100 College Algebra test four   (11 students)   Name:

1. Write $y = x^2 - 16x + 353$ in vertex form $(y - k) = a(x - h)^2$

2. Write the vertex (h, k) for $y = x^2 - 16x + 353$

3. Write the $y = 8x^2 + 34x - 705$ in vertex form $(y - k) = a(x - h)^2$

4. Write the vertex (h, k) for $y = 8x^2 + 34x - 705$

5. Perform the long division $(x^3 + 3x^2 - 33x - 35) \div (x - 5)$

6. _____ How many linear factors does $g(x) = 16x^2 + 40x + 25$ have?

7. _____ How many zeros does $g(x) = 16x^2 + 40x + 25$ have?

$h(x) = 256x^6 - 2048x^5 + 9696x^4 + 6400x^3 - 32175x^2 - 5000x + 25625$

8. _____ How many linear factors does h(x) have?

9. _____ How many zeros does h(x) have?

10. _____ How many zeros does j(x) = 7 have?

11. For $\dfrac{(x-2)}{(x^2-4x-5)}$
        a. Find the y-intercept.

        b. Find the x-intercept(s) [zero(s)]

        c. Find the vertical asymptotes

        d. Find the horizontal asymptote.

Maxima scratch work
(%i1) (4*x+5)*(4*x+5)*(4*x-5)*(4*x-5)*(x-4-5*%i)*(x-4+5*%i);

(%o1)   (x - 5 %i - 4) (x + 5 %i - 4) (4 x - 5)^2 (4 x + 5)^2
(%i2) expand(%);

(%o2)   256 x^6 - 2048 x^5 + 9696 x^4 + 6400 x^3 - 32175 x^2 - 5000 x + 25625
(%i3) divide(x^3+3*x^2-33*x-35,x-5);

(%o3) [x^2 + 8 x + 7, 0]

Gnuplot scratch work: plot file contents
reset
set border
set xtics 1
set ytics 1
set grid
set xzeroaxis lt 9 lw 2
set yzeroaxis lt 9 lw 2
set style line 1 lt -1 lw 3
set style line 2 lt 5 lw 3
set style line 3 lt 12 lw 3
set xrange [-2:6]
set yrange [-7:7]
f(x)=x-2
g(x)=x**2-4*x-5
h(x)=f(x)/g(x)
plot h(x) ls 1