Review

January-12-14
12:19 PM

MHF

1. Factor

(a) $27a^3b^3 + 1728c^3$

(b) $(x-5)^3 - (5x-1)^3$

(c) $12x^3 + 8x^2 - 3x - 2$ Hint try denom 2

(d) $(x^2+8)^2 - 36x^2$

(e) $5(x^6+1)^4(6x^5)(3x+2)^3 + 3(3x+2)^2(3)(x^6+1)^5$

(f) $2x^2(x-1)^{1/2} - 5(x-1)^{-1/2}$

2. Perform the division + record result

(a) $(12x^4 - 6x^3 - x + 81) \div (3x^2 - 9)$

(b) $(2x^3 + 5x^2 - 4x - 5) \div (2x+1)$ show synthetic here

3. Use comparing coefficients to find quotient if

$-6x^3 + 29x^2 + 7x - 13 \div 2x - 1$ and remainder is -3

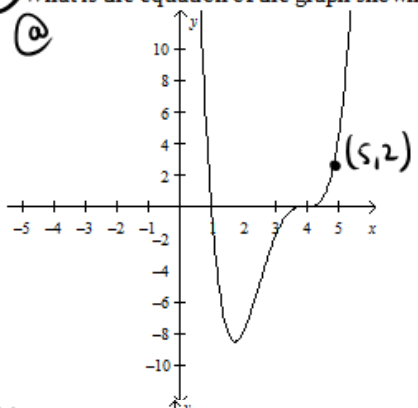
4. Find the missing constants for

$f(x) = ax^3 + 37x^2 + cx + 6$ if $5x+1$ is a factor

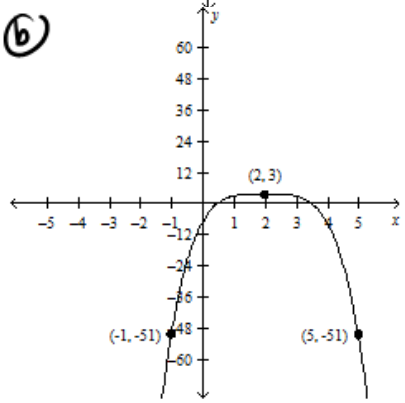
and if $(x+3)$ is divided the remainder is -42

5. What is the equation of the graph shown below?

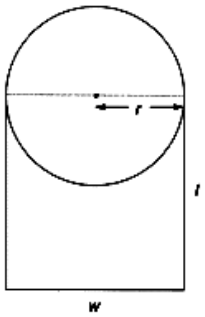
(a)



(b)



6. Charice is painting the lines for her own basketball court. The free throw section will be a rectangle with a semi-circle on top. The length of the rectangle will be 2.25 metres greater than the width. Using 3.14 for π, the area of the court is 31.28 m². Determine the dimensions of the free throw section. ($A=\pi r^2$ is the area of a circle)



7. The area of a rectangular garden is $(3x^3 + 6x^2 + x + 2)\ m^2$. The garden is $(x+2)$ m long. How wide is the garden?

8. Sketch

(a) $g(x) = -3x^4 + x^3 - 9x^2 + 2x - 3$ → make a list of zeros + t.p

(b) $f(x) = 0.3(1-2x)^3(x+3)^6$ → state degree leading coeff zeros

(b) $f(x) = 0.3(1-2x)^3(x+3)^6$ → state degree, leading coeff, zeros → then sketch

(9) Solve when $f(x) \le 0$

$f(x) = -5x(x^2+4)(7-x)^2(x^2-10)$

10. Solve

(a) $3x^2 + 1 > 25$

(b) $-2\left|1 - \frac{2x}{3}\right| + 1 < -7$

(c) $-2|x - 20| \le 6$

(d) $-2|x + 10| \ge -9$

(e) $x^4 + 2x^3 + 4x^2 - 7x > 0$

(f) $x^3 - 5x^2 \leqslant x - 5$

(11) Find a Family or Unique Equation

(a) degree 4, with two distinct double roots, one of them at -5

(b)

x	1	3	5	7	9	11
y	26	48	46	20	−30	−104

(c) Determine an expression for a family $f(x)$ in which $f(x)$ is a cubic polynomial such that $f(x) > 0$ when $x < 3$ and $x > -1$, and $f(x) < 0$ when $x > 3$, and $f(-1) = 0$. Explain.

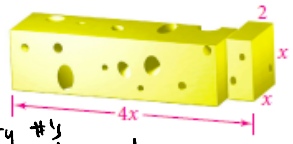
(12) Erik finds a piece of property in the shape of a right triangle. He finds that the longer leg is 20 m longer than twice the length of the shorter leg. The hypotenuse is 10 m longer than the length of the longer leg. Find the lengths of the sides of the triangular lot.

(13)

a. The sum of two positive numbers is 4 and the sum of their cubes is 28. What is the sum of their squares?

b. The product of two positive numbers is 96 and the sum of their squares is 208. What are the two numbers?

(14) **Geometry** Suppose a 2-in. slice is cut from one face of the cheese block as shown. The remaining solid has a volume of 224 in.^{3}. Find the dimensions of the original block.



Hint: try #'s with denom. 1

(15) **Savings** The polynomial $1600x^3 + 1200x^2 + 800x$ represents your savings, with interest, from a summer job after three years. The annual interest rate equals $x - 1$. Find the interest rate needed so that you will have \$4000 at the end of three years. use technology (irrational solution)

AP

Sketch the following power functions.

1. $y = 2x^5$

2. $y = -3x^4$

3. $y = -x^{\frac{3}{4}}$

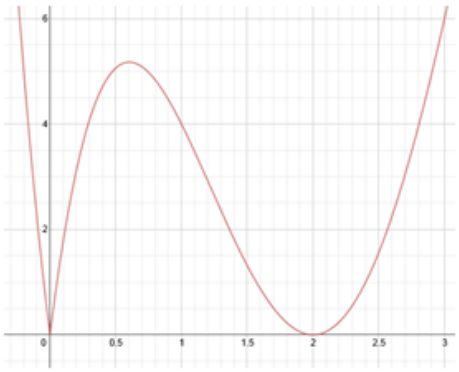
4. $y = \frac{1}{2}x^{-4}$

5. $y = -\frac{1}{x^3}$

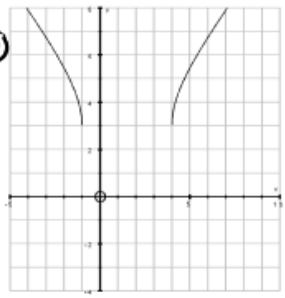
6. $y = 2x^{\frac{4}{5}}$

(7) Find the equation for – don't worry about the Leading Coefficient.

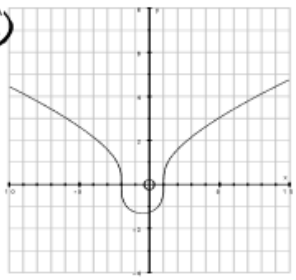
(a)



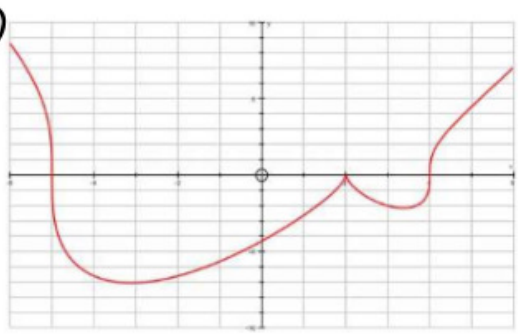
b)



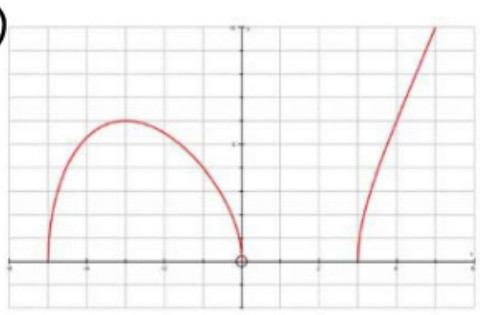
c)



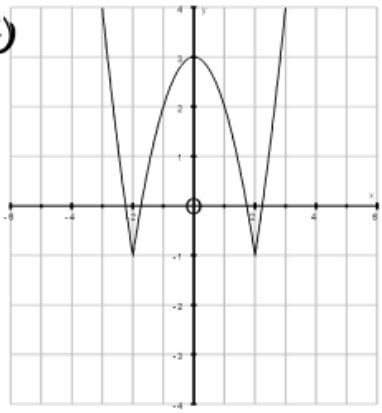
d)



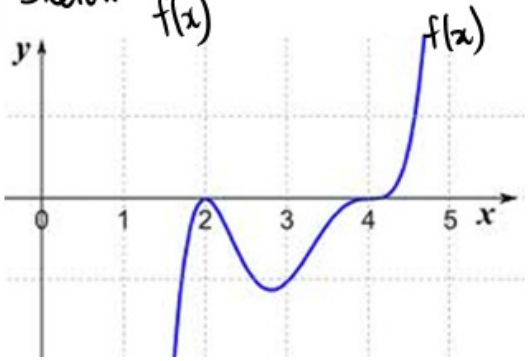
e)



f)



(7) Sketch $\frac{1}{f(x)}$



(8.)

(a) Find the number of complex zeros of $f(x) = x^3 + x^2 - x + 2$. Find all the zeros.

(b) **Writing** A student states that $2 + \sqrt{3}$ is a root of $x^2 - 2x - (3 + 2\sqrt{3}) = 0$. The student claims that $2 - \sqrt{3}$ is another root of the equation by the Irrational Root Theorem. Explain how you would respond to the student.

(c) $\sqrt{5}$ and $-\sqrt{5}$ are roots of a polyn of degree 3, find a family ← with integer coefficients.

(d) $2 + i$ and $-2 - i$ are roots of a polyn of degree 4, find a family

(9) Simplify

(a) $(1 + i)^4$.

(b) $(-4i)(6i)^3$

(c) $(4 - 3i)(5 + i)$

(d) $\frac{4+2i}{3-i}$

(e) $\frac{2+i}{2i}$

(f) $\sqrt{-3}\sqrt{-12}$

(g) $\sqrt{-48} - \sqrt{-27}$

(h) $(-1 + \sqrt{-3})^2$

(i) Plot the resulting complex #'s on the complex plane + find the modulus. for (d)(e)(f)(g)(h)