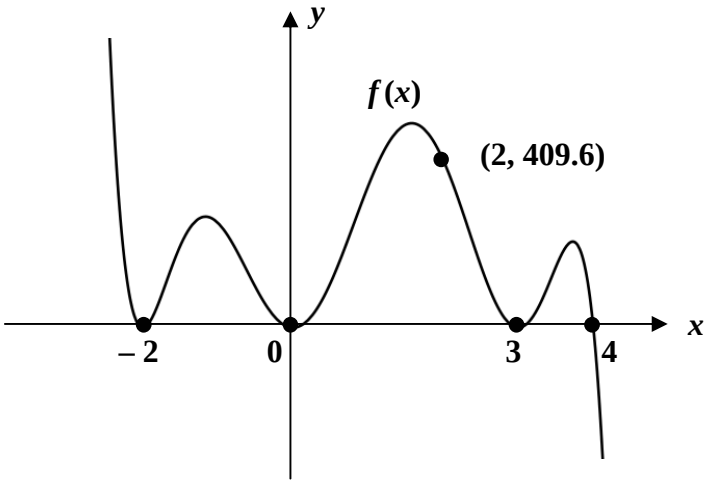
HW 12 Due 05/07/14

1) Solve $2\cos(2\theta) = 0.55\sin\theta$ for $0 \le \theta < 2\pi$. **Hint:** $\cos(2\theta) = 1 - 2\sin^2\theta$

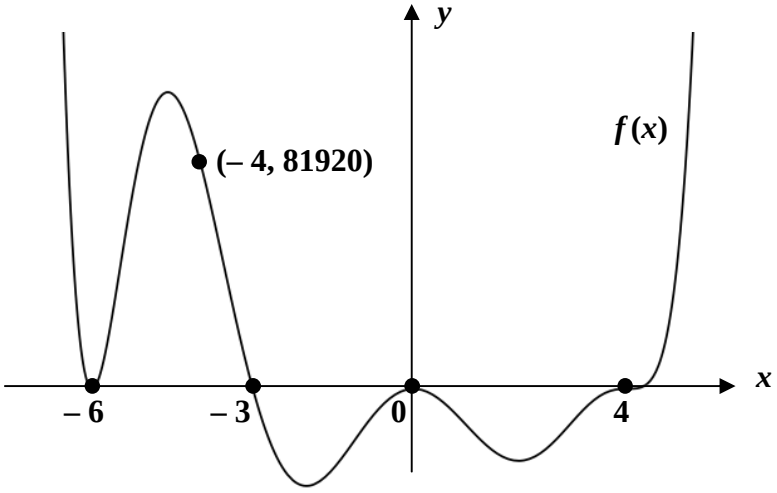
2) Algebraically, find the zeros of. $f(x) = x^4 - 5x^3 - 5x^2 + 25x$

3) Algebraically, find the zeros of $f(x) = x^5 - 13x^3 + 36x$

4) Find a possible formula for $f(x)$.



5) Find a possible formula for $f(x)$.



6) The total cost ***C*(*n*),** in dollars, to produce n gallons of paint is given by $C(n) = 80000 + 20n$.

The average cost of producing n units is $A(n) = \dfrac{C(n)}{n}$.

a) Evaluate: (i) C(100) (ii) C(100000) (iii) C(1000000) (iv) C(10000000)
b) Evaluate: (i) A(100) (ii) A(100000) (iii) A(1000000) (iv) A(10000000)
c) In the context of the problem, explain the trend that you notice in the values of ***A*(*n*)** as n gets large.
d) Include a sketch of ***A*(*n*).** You may use a graphing calculator.
Use a window with xmin = 0, xmax = 100000, ymin = 0 and ymax = 100.

7) A mixture contains 4 kg of copper and 10 kg of tin. Then, we add x kg of copper to the mixture of 14 kg. The model $f(x)$ represents the concentration of copper in the mixture and is defined as

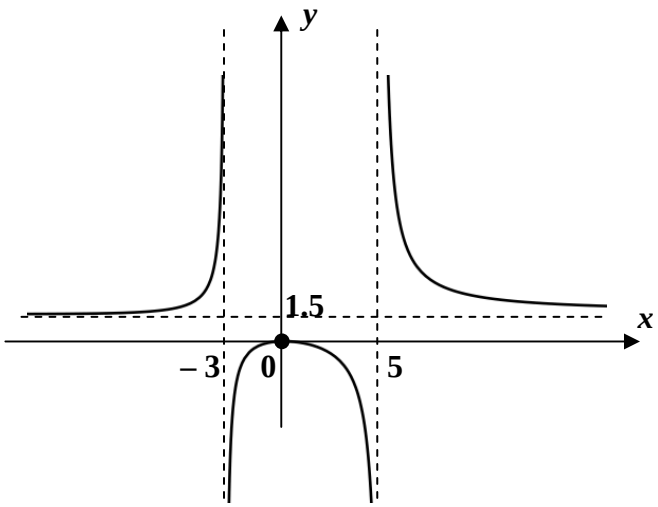
$$f(x) = \frac{\text{Total amount of copper}}{\text{Total amount of mixture}}$$

a) Find a formula for $f(x)$, in terms of x, the amount of copper added to the mixture of 14 kg.

b) Evaluate: (i) $f(1)$ (ii) $f(10)$ (iii) $f(100)$ (iv) $f(10000)$

c) In the context of the problem, based on your results from part (b), what trend do you notice in the values of $f(x)$ as x gets large?

8) Find a possible formula for $f(x)$.



9) Find a possible formula for $f(x)$.