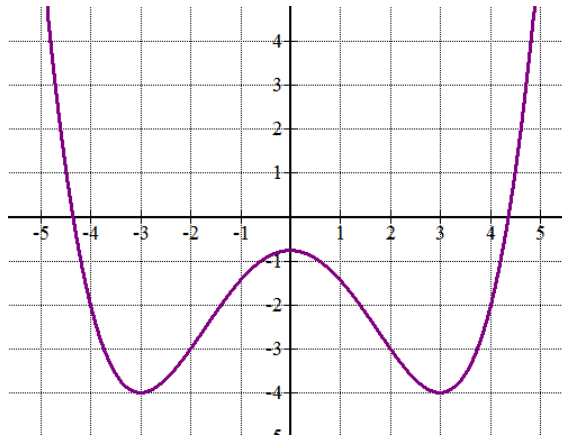


# MHF4U Final Assignment

Name: \_\_\_\_\_

1. For the function below:

(8 marks)



- State the Domain and Range of  $f(x)$ .
- State all of the increasing intervals.
- State all of the decreasing intervals.
- Mark on the graph each of the following (if they exist):
  - Local Maximum
  - Overall Maximum
  - Local Minimum
  - Overall Minimum

2. The following is the height of a ball propelled by a launcher set on the ground. (3 marks)

|        |   |     |     |     |     |     |     |     |     |     |     |     |
|--------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Time   | 0 | 0.2 | 0.4 | 0.6 | 0.8 | 1   | 1.2 | 1.4 | 1.6 | 1.8 | 2   | 2.2 |
| Height | 0 | 15  | 40  | 75  | 120 | 175 | 190 | 188 | 185 | 180 | 177 | 174 |

Calculate the average velocity between 0.8 and 1.4 seconds.

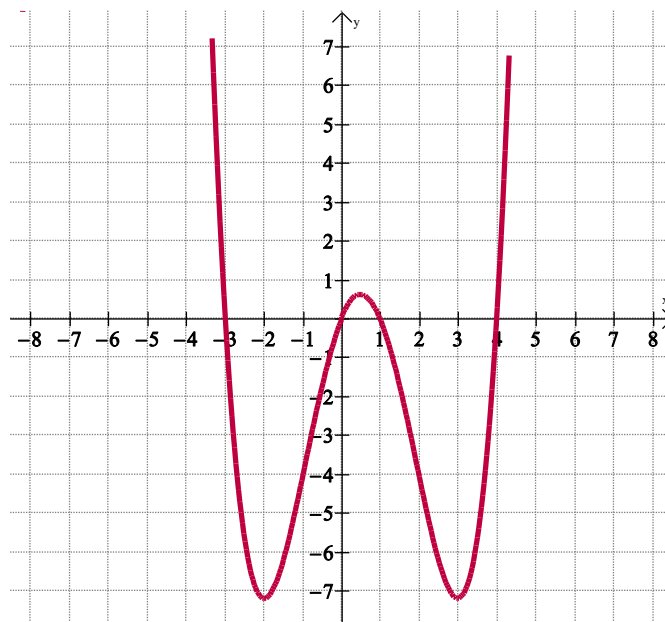
3. Describe the end behaviour of each function. (2 marks)

a)  $y = -2x^5 - 4x^2 + 1$

b)  $y = 6x^4 - 4x^3$

4. State the general equation for the following graph and then solve for a.

(4 marks)



5. Solve the following inequality by first factoring the polynomial then making a graph or a table. (6 marks)

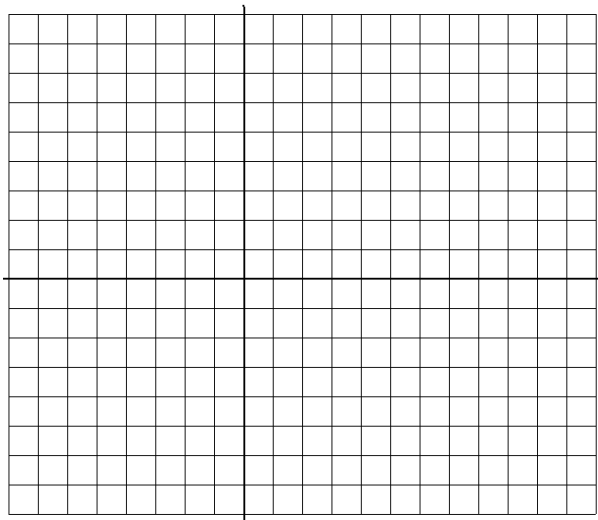
$$2x^3 - x^2 - 5x - 2 > 0$$

6. Given the function  $f(x) = \frac{x+1}{x^2 - 3x - 10}$ , (7 marks)

a) State the domain and the x- and y- intercepts.

b) Determine the equations of all Vertical and Horizontal Asymptotes.

c) Sketch the function  $f(x)$ , showing the work you did to determine the behaviour of the function near its asymptotes. Neatly label all key features on your sketch.



7. Sketch each of the angles below. Then determine the exact value of the trigonometric ratios given. (4 marks)

a)  $\csc \frac{5\pi}{6}$

b)  $\cot \frac{5\pi}{4}$

8. For the function, state the period, phase shift, vertical displacement and amplitude (4 marks)

$$y = 2\sin\left(3\left(x + \frac{\pi}{4}\right)\right) - 1$$

9. For the function,  $g(x) = 2 \log_{10} (x + 2)$ : (6 marks)

i) State the domain and the equation of the asymptote.

ii) Determine the x and y intercepts.

iii) State the intervals of increase and decrease.

10. Solve for x. (6 marks)

a)  $64^{x-1} = 16^{2x}$

b)  $\log (4x - 1) = \log (x - 1) + \log 2$