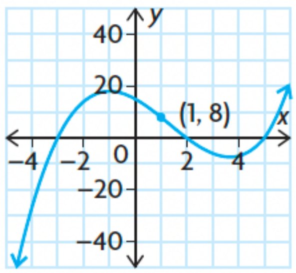
Polynomial Test

Question 1:

Write the equation of each function.



Question 2:

a) Given $f(x) = x^4 + 5x^3 + 3x^2 - 7x + 10$, determine the remainder when $f(x)$ is divided by each of the following binomials, without dividing.

i) $x - 2$

ii) $x + 4$

iii) $x - 1$

b) Are any of the binomials in part a) factors of $f(x)$? Explain.

Question 3:

Given an equation, describe order of root, quadrant extension, and end behavior.

$y = x(2x + 1)(x - 3)(x - 5)$

$y = x^2(3x - 2)^2$

Question 4: (pg132)

Describe the end behaviours of each function, the possible number of turning points, and the possible number of zeros. Use these characteristics to sketch possible graphs of the function.

a) $f(x) = -3x^5 + 4x^3 - 8x^2 + 7x - 5$ **b)** $g(x) = 2x^4 + x^2 + 2$

Question 5: (pg175)

When $2x^3 - mx^2 + nx - 2$ is divided by $x + 1$, the remainder is -12 and $x - 2$ is a factor. Determine the values of m and n.

Question 6: Inequalities

Sketch a graph of the function $y = 4x^4 + 6x^3 - 6x^2 - 4x$.

Use either long division and synthetic division to solve the inequality. Must show ALL steps.

Question 7 and 8: only choose one (word problem)

Example 3: A box is in the shape of a rectangular prism. One side is a square, and the length is 12 units longer than the square sides. The volume of the box is 135 cubic units. What are the dimensions of the box?

Question 9: (pg170)

18. Divide.

a) $(x^4 + x^3y - xy^3 - y^4) \div (x^2 - y^2)$

b) $(x^4 - 2x^3y + 2x^2y^2 - 2xy^3 + y^4) \div (x^2 + y^2)$

Question 10: Secret, but it's about number of turning points and x-intercept. Review Chapter 3.1 and 3.2.

Question 11: Sum and difference of cubes

Factor each expression.

a) $\frac{1}{27}x^3 - \frac{8}{125}$

b) $-432x^5 - 128x^2$

c) $(x-3)^3 + (3x-2)^3$

d) $\frac{1}{512}x^9 - 512$

$x^6 - \frac{1}{64}y^{12}$

Question 12:
Explain why odd-degree polynomials do not have absolute maximum or minimum, whereas even-degree polynomial functions must have

Question 13:
Describe factor theorem and remainder theorem