

SEND - IN ASSIGNMENT**UNIT 3****Polynomials**

Name: _____

Teacher: _____

If you are cross enrolled, state your other school besides DESK.

Date that you submitted this assignment:

- You must show ALL work to receive full credit for the questions.

Total _____ = _____ %
50

SHOW ALL WORK FOR FULL MARKS

1. Use long division to determine the remainder and the quotient for:

$$(3x^3 - 2x^2 + 7) \div (x + 2)$$

1) _____
3 marks

2. Use synthetic division to determine remainder and quotient for:

$$(4x^5 - 10x^4 - 9x^2 + 2) \div (x - 3)$$

2) _____
3 marks

3. Use synthetic division to solve for k. When $x^3 + kx^2 - 2x - 7$ is divided by $(x - 2)$ the remainder is 17. What is the remainder when it is divided by $(x + 1)$?

3) _____
2 marks

4. For $P(x) = 2x^4 - 3x^3 + 5x^2 - 7$ determine $P(2)$

4) _____
1 mark

5. Find the remainder when $x^{17} - 3x^{11} + 5$ is divided by $(x + 1)$.

5) _____
1 mark

6. Given $P(x) = 3x^4 + 4x^3 - 3x^2 - 3x - 10$. Is $(x + 2)$ a factor of $P(x)$?

6) _____
1 mark

7. Use the remainder theorem to solve for k and m .

a) When $3x^4 + kx^2 + 7x + 9$ is divided by $(x + 2)$, the remainder is 19.

7a) _____
2 marks

b) When $kx^3 + mx^2 + x - 6$ is divided by $(x - 2)$, the remainder is 24. When this polynomial is divided by $(x + 1)$, the remainder is negative 15.

7b) _____
3 marks

8. According to the Rational Zero Theorem, list all possible rational roots of

$$P(x) = 3x^2 + 5x - 12$$

8) _____
2 marks

9. Use an algebraic method to factor each of the following completely and find the zeros.

a) $f(x) = 3x^3 + 7x^2 - 4$

b) $f(x) = 4x^3 + 12x^2 + 5x - 6$

a) _____
3 marks

b) _____
3 marks

10. If 2 is a root of the equation $3x^3 + x^2 - 20x + 12 = 0$, determine the other roots.

10) _____
2 marks

11. A box is constructed such that the length is twice the width and the height is 4 cm longer than the width, with a volume of 720 cm^3 . Find the dimensions of the box.

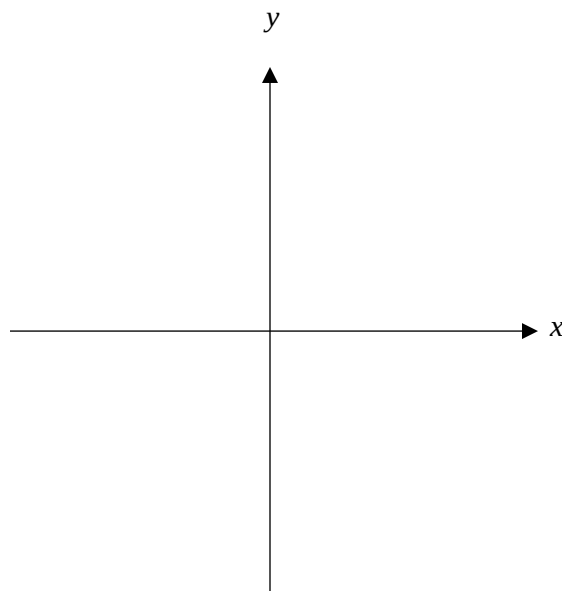
11) _____
4 marks

12. An open top box is made from a piece of cardboard measuring 12 in x 15 in. Cutting out squares from each corner and folding the edges up makes a box with a volume of 162 in^3 . How large a square must be cut from each corner? (Hint: the answer is a rational number.)

12) _____
4 marks

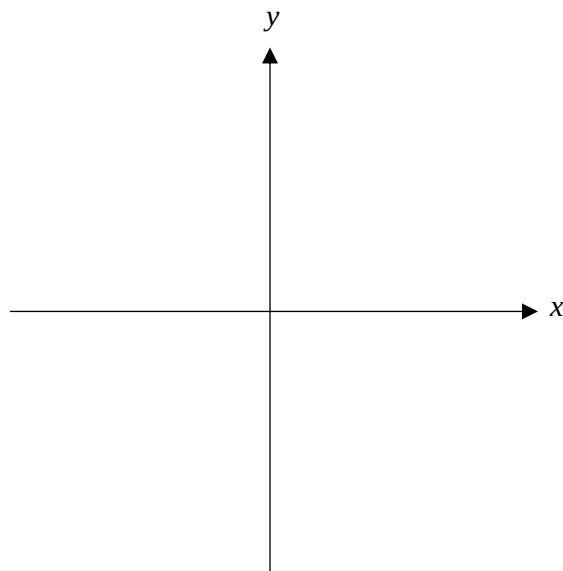
13. Sketch the graph of each polynomial function without a calculator. Clearly show the zeros and the y-intercept. **Show algebraically how you determined the zeros and y-intercept.**

a) $f(x) = x^3 + 2x^2 - 11x - 12$



3 marks

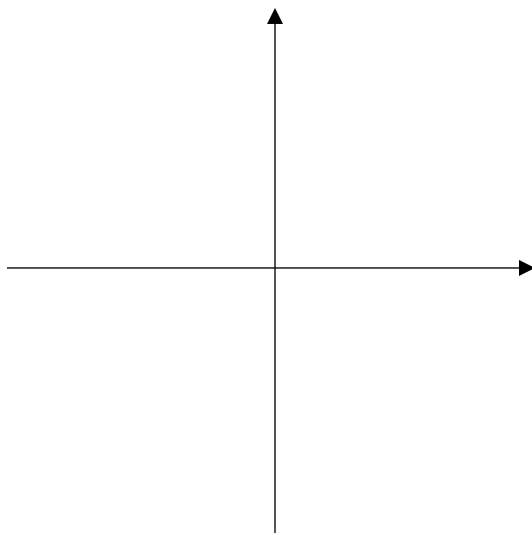
b) $f(x) = -x^4 + 5x^3 + 4x^2 - 44x + 48$



3 marks

14. Use your graphing calculator to determine the following for the polynomial function:

$$f(x) = -x^3 - 4x^2 + 5x + 11 \quad (10 \text{ marks})$$



- | | |
|---------------------------------------|----------|
| a) Domain | a) _____ |
| b) Range | b) _____ |
| c) The zeros | c) _____ |
| d) Y-intercept | d) _____ |
| e) coordinates of relative maximum | e) _____ |
| f) coordinates of relative minimum | f) _____ |
| g) intervals where $f(x) \geq 0$ | g) _____ |
| h) intervals where $f(x) < 0$ | h) _____ |
| i) what is the start and end behavior | i) _____ |