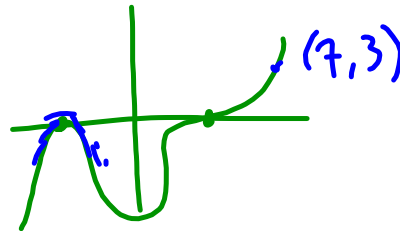


REVIEW: Unit 3 – Polynomial Functions

> Characteristics of polynomial functions

- Domain and range
- degree
- leading coefficient
- End behaviours
- Turning points
- intercepts

Note: I always time my tests using the most efficient method possible.



> Factored form

- Intercepts
- Order

> Developing the equation (family of functions)

> Transformations

> Dividing polynomials - long - synthetic

> Remainder theorem

> Factor Theorem

> Factoring higher degree polynomials

> Sum and difference of cubes

$$y = a(x-2)^3(x+5)^2$$

From 3.7 Entertainment: p.182 #2acegi, 3, 4acegi, 5ac, 6

s

Today's Work

p. 122 #1d, 2

pp. 184-185 #1, 2*, 3, 4d, 5d, 6, 8bcd, 9cef, 10ad, 12cd
**the answer is wrong in the back for #2*

pp. 184-185 #13 to 18

+ **p. 186 Chapter Self-Test** (60 minutes)

Questions 2 and 9: would be worth several marks each on a test.

Questions 4 and 6: an explanation is required as well.

Question #3a has an incorrect answer. It should be: $(x-9)(x+8)(2x+1)$

p.182 #3c

3. Factor each expression.

c) $(x+5)^3 - (2x+1)^3$

let $a = x+5$ $b = 2x+1$

$$(a+b)^3$$

$$= (a+b)(a^2 - ab + b^2)$$

$$= ((x+5) - (2x+1)) \left((x+5)^2 + (x+5)(2x+1) + (2x+1)^2 \right)$$

$$(a-b)^3$$

$$= (a-b)(a^2 + ab + b^2)$$

$$= (x+5 - 2x - 1) \left(x^2 + 10x + 25 + 2x^2 + x + 10x + 5 + 4x^2 + 4x + 1 \right)$$

$$= (-x+4)(7x^2+25x+31)$$

$$f(x) = -(x-4)(7x^2+25x+31)$$

$$b^2 - 4ac$$

$$= 25 - 4(7)(31)$$

< 0
∴ no real roots

if graphing ↗

x-int (zeros) / y-int

if $f(x) = 0$ let $x=0$

$$x = 4$$

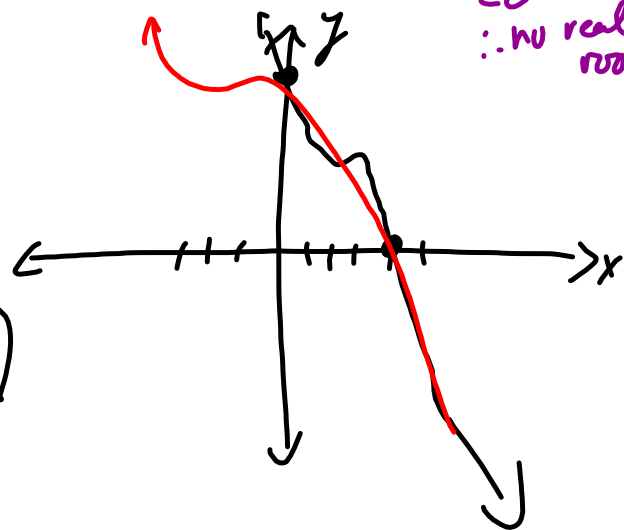
(order 1)

$$f(0) = -(-4/31) = +124$$

lead. coeff -ve; cubic

$$\therefore x \rightarrow \infty, y \rightarrow -\infty$$

$$x \rightarrow -\infty, y \rightarrow \infty$$



p.185

9. The function $y = x^3$ has undergone each of the following sets of transformations. List three points on the resulting function.

- c) reflected in the x -axis, vertically compressed by a factor of $\frac{6}{11}$, horizontally translated 5 units to the left, vertically translated 16 units up

$$f(x) = -\frac{6}{11}(x+5)^3 + 16$$

$$\begin{aligned} f(0) &= -\frac{6}{11}(125) + 16 \\ &= -\frac{750}{11} + \frac{176}{11} \\ &= -\frac{574}{11} \quad \therefore \left(0, -\frac{574}{11}\right) \\ &\quad \text{Also } (-5, 16) \end{aligned}$$