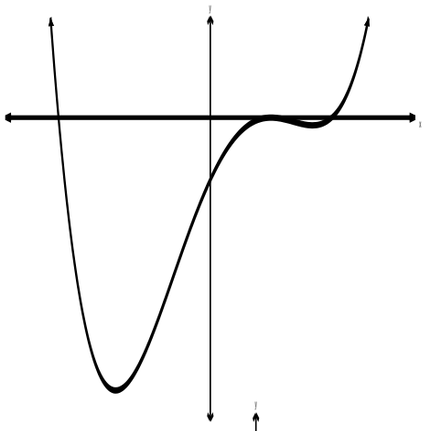
Mathematics 3200 Test
Chapter 3: Polynomial Functions

NAME:_____

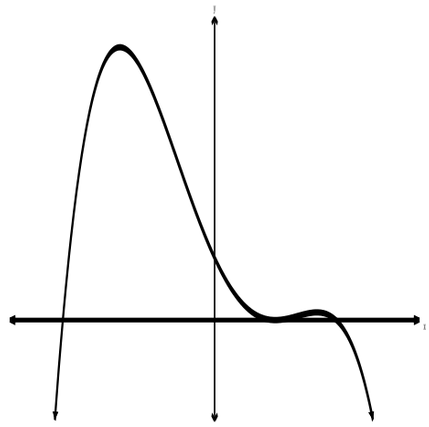
SECTION A: Selected Response. Place the LETTER of your response in the ____ at the right. 12 pts

1. Which represents a quartic polynomial function with leading coefficient negative and with one zero of multiplicity 2 and two zeroes of multiplicity 1? 1._____

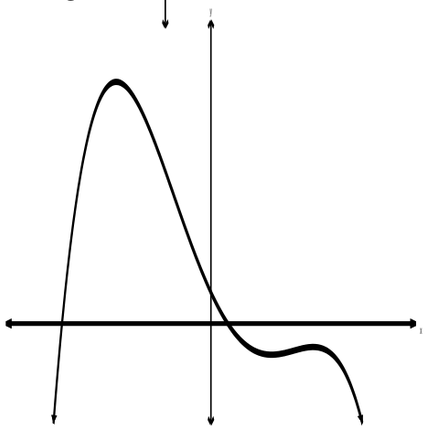
A



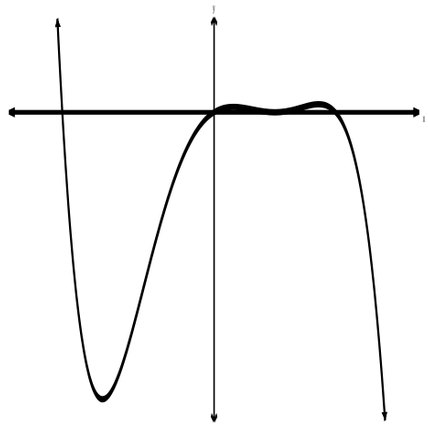
B



C



D



2. Which value of N is correct in the synthetic division shown 2._____

3	1	-5	4	9	6
		?	?	?	?
	?	?	N	?	?

A -2
B -20
C 12
D 16

3. What is the remainder when $(4x^4 - 7x^3 + x - 2)$ is divided by $x + 1$ 3._____

A -14
B -4
C 8
D 12

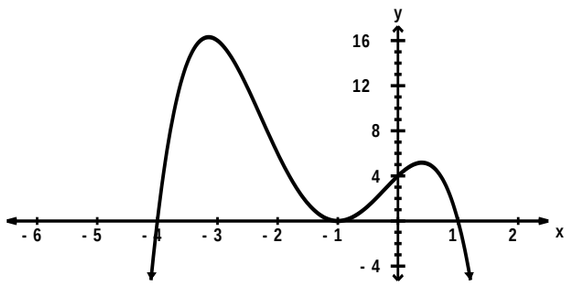
4. A cubic polynomial function has the following characteristics: 4._____
P(-2) = 0, P(3) = 0, P(1) = 0 and P(2) > 0
Which description for this function is correct?

A Negative leading coefficient and negative y-intercept
B Negative leading coefficient and positive y-intercept
C Positive leading coefficient and negative y-intercept
D Positive leading coefficient and positive y-intercept

5. Given that $x-3$ is a factor of $x^4+kx^3-7x^2+22x+6k$, what is the value of k 5._____

A $-\frac{16}{11}$
B $\frac{16}{11}$
C $-\frac{22}{9}$
D $\frac{22}{9}$

6. Which equation represents the graph shown? 6._____



A $y=(x-4)(x-1)^2(x+1)$
B $y=-(x-4)(x-1)^2(x+1)$
C $y=(x+4)(x+1)^2(x-1)$
D $y=-(x+4)(x+1)^2(x-1)$

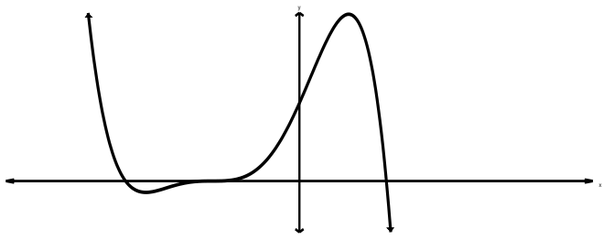
7. According to the Intergal Zeroes Theorem, which is not a possible integral zero of $P(x)=x^3+7x^2-12x+24$ 7._____

A -4
B 9
C 3
D -8

8. When a polynomial $P(x)$ is divided by $(x-2)$, the quotient is (x^2-4x+6) and the remainder is -7. What is the polynomial? 8._____

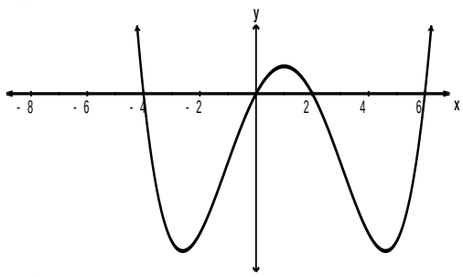
A $x^3-6x^2+14x-5$
B x^3-6x^2+7x+2
C $x^3-6x^2+14x-19$
D $x^3-6x^2+21x-26$

9. The graph of $P(x)=ax^5+bx^3+cx^2+dx+e$. Which statement about the values of a and e is correct? 9._____



A $a>0$ and $e<0$
B $a>0$ and $e>0$
C $a<0$ and $e<0$
D $a<0$ and $e>0$

10. Which interval describes where the function is negative? 10._____



A $x\in(-\infty,-4)\cup(0,2)\cup(6,\infty)$
B $x\in(-\infty,-4]\cup[0,2]\cup[6,\infty)$
C $x\in(-4,0)\cup(2,6)$
D $x\in[-4,0]\cup[2,6]$

11. Which statement about $P(x)=-x^5+5x^3-4$ is false? 11._____

A The end behaviour of its graph is "up in quadrant 2 and down in quadrant 4".
B It is an odd function.
C It has a zero at $x=1$
D The y-intercept is (0, -4)

12. What are the zeroes of the function $P(x)=x^3-3x^2-16x+48$ 12._____

A $x=3, x=\pm4$
B $x=-3, x=\pm4$
C $x=-4, x=\pm3$
D $x=4, x=\pm3$

Section B: Asnwer ALL questions in the space provided. Algebraic methods are required. Full credit will only be awarded if correct answers are supported by appropriate workings.

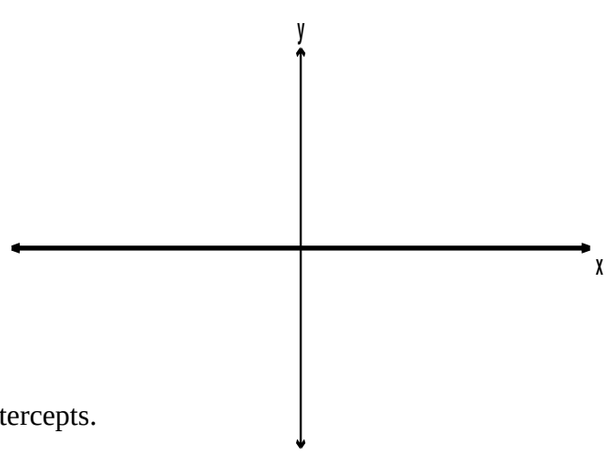
1. Algebraically determine the zeroes of the polynomial function $P(x) = x^3 - x^2 - 14x + 24$ 4 pts

2. Complete the following for the polynomial function $P(x) = -2x^4 - 10x^3 + 8x^2 + 40x$ 10 pts

(a) Describe the end behaviour of this function.

(b) Algebraically determine all intercepts

(c) Create a sign table to show where the function is positive and where it is negative.



(d) Sketch its graph on the axes provided, labelling all intercepts.

3. The polynomial function $P(x) = 4x^4 - 7x^3 + mx^2 + nx + 6$ has $(x - 1)$ as one of its factors. When it is divided by $(x + 1)$, the remainder is 30. Algebraically determine the values of m and n. 4 pts

4. An open top box is made from a 16 m by 12 m rectangular piece of sheet metal by cutting congruent squares of length x from each corner and folding up the sides. Identify any restrictions on x and algebraically determine what size squares must be removed to produce a box with a volume of $192\ m^3$. 6 pts