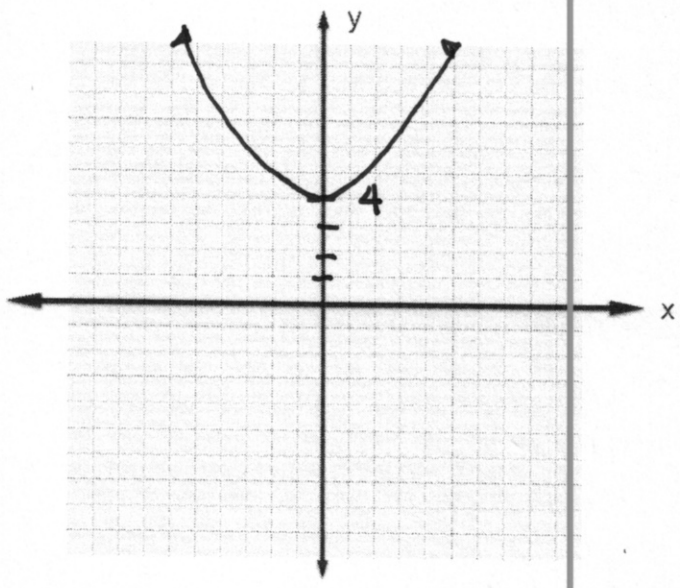
Answer Sheet

1	Use Graph on Test Sheet	12	$(x+1)(2x^2-x+2)-10$
2	Use Graph on Test Sheet	13	$(x+3)(4x^3+9x^2+7x+20)+55$
3	Use Graph on Test Sheet	14	$f(1) = -9$
4	Use Graph on Test Sheet	15	$f(-\frac{3}{2}) = 0$
5	Use Graph on Test Sheet	16	$x+1$ is not a factor of f
6	Use Graph on Test Sheet	17	$x+3$ is a factor of f
7	Use Graph on Test Sheet	18	$x=3$; $x=1$; $x=-2$
8	Use Graph on Test Sheet	19	$x=-4$; $x=3/2$; $x=-1/3$
9	Use Graph on Test Sheet	20	$x=-3$; $x=-5$, $x=2$
10	Use Graph on Test Sheet	21	$x=5$; $x=-2$, $x=-1$
11	Use Graph on Test Sheet	22	$x=1$; $x=-\frac{1}{2} \pm \frac{\sqrt{3}}{2}$;

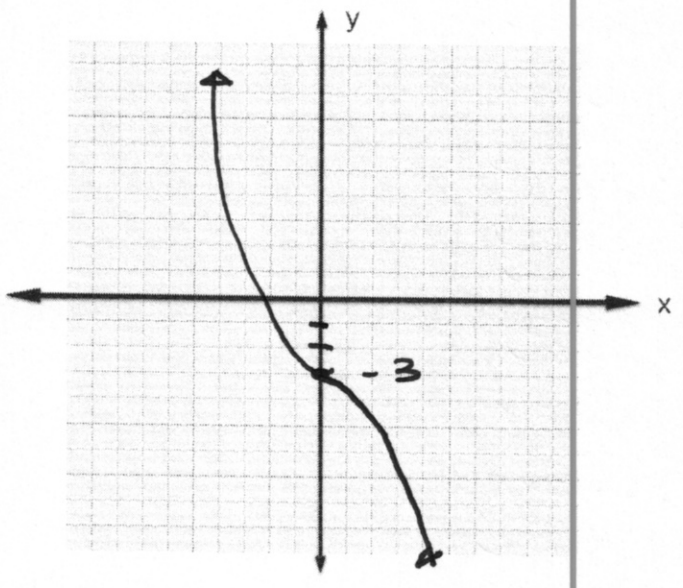
East Los Angeles College
Department of Mathematics
Math 245
Test 4

Sketch the following curves.

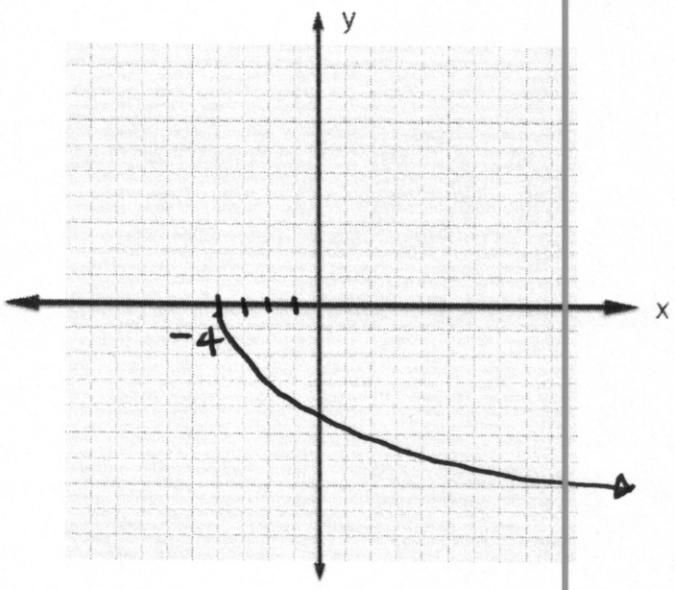
1. $f(x) = x^2 + 4$



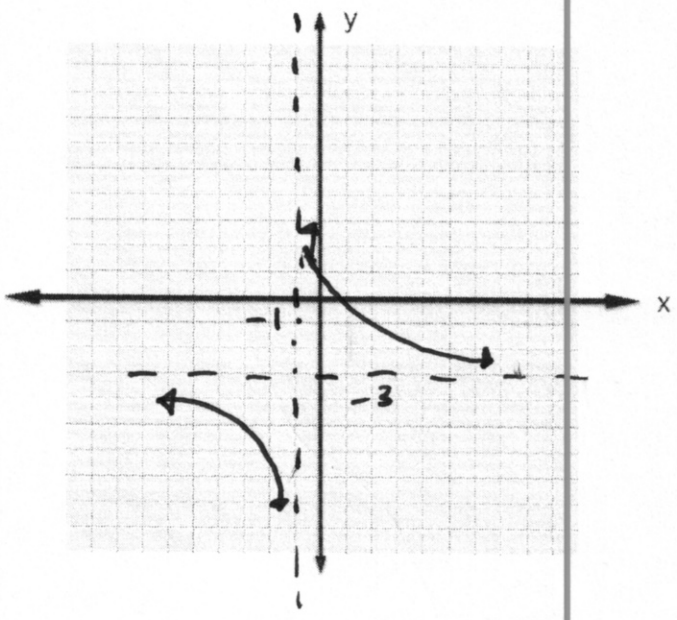
2. $f(x) = -x^3 - 3$



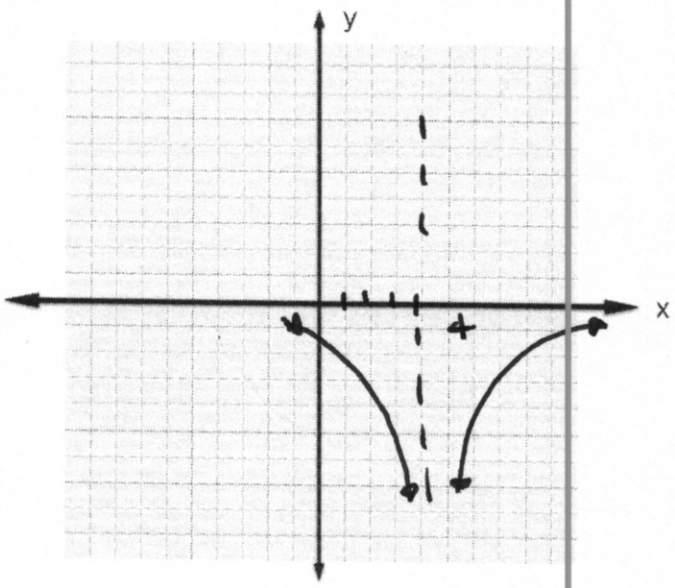
3. $f(x) = -\sqrt{x+4}$



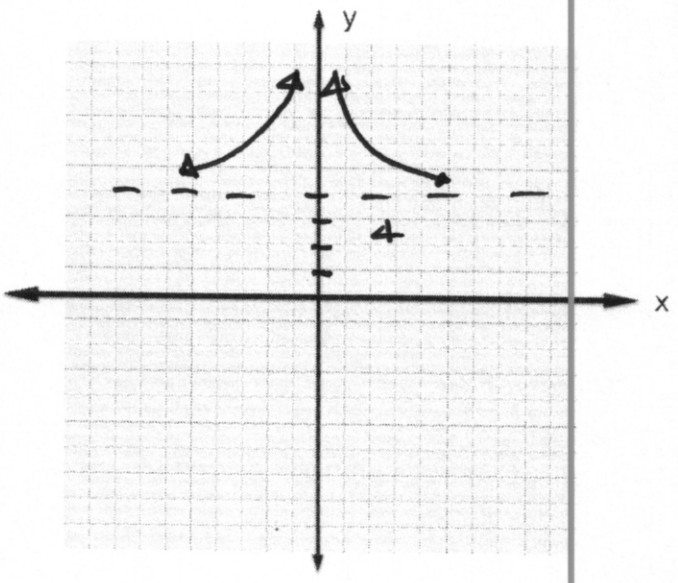
4. $f(x) = \frac{1}{x+1} - 3$



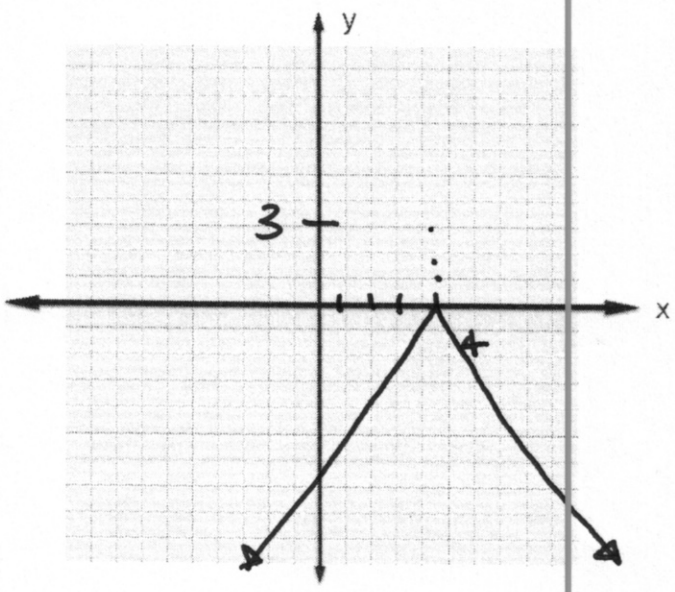
5. $f(x) = -\frac{1}{(x-4)^2}$



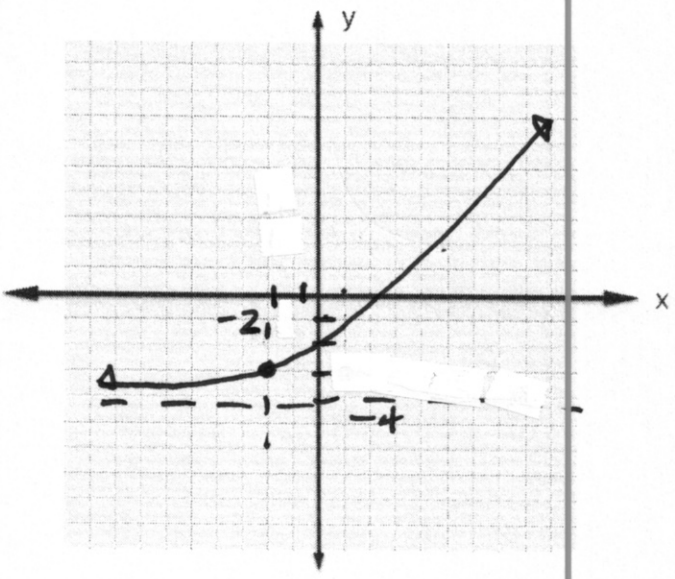
6. $f(x) = \frac{1}{x^2} + 4$



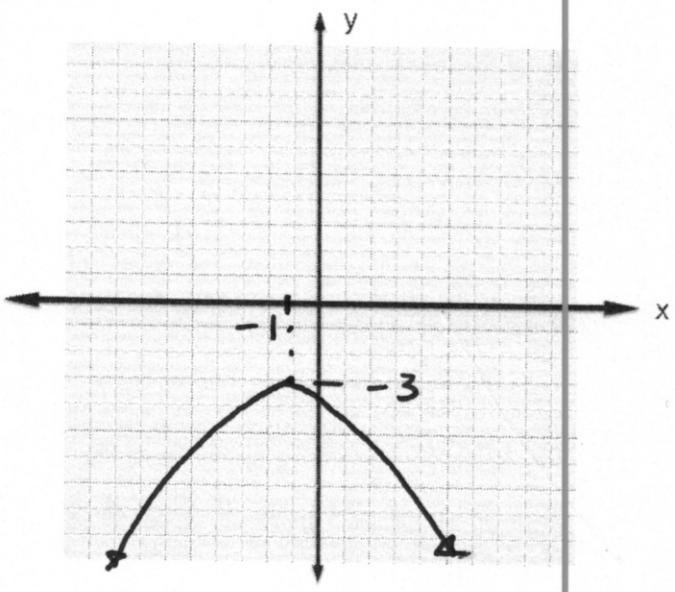
7. $f(x) = -|x - 4| + 3$



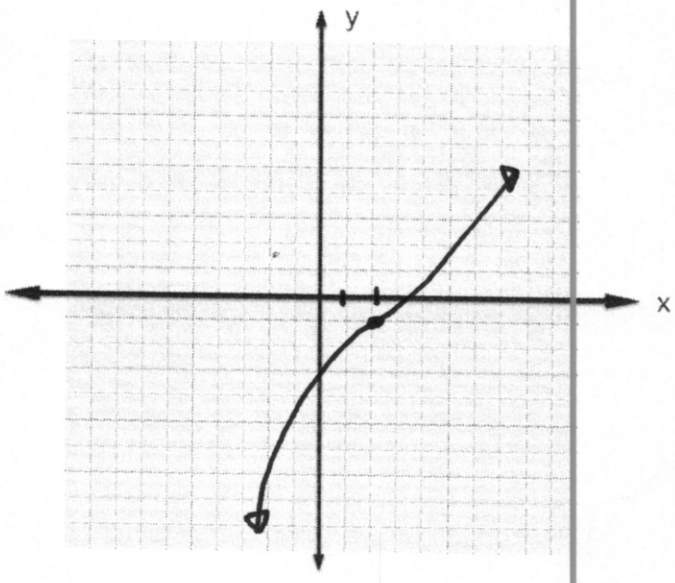
8. $f(x) = e^{x+2} - 4$



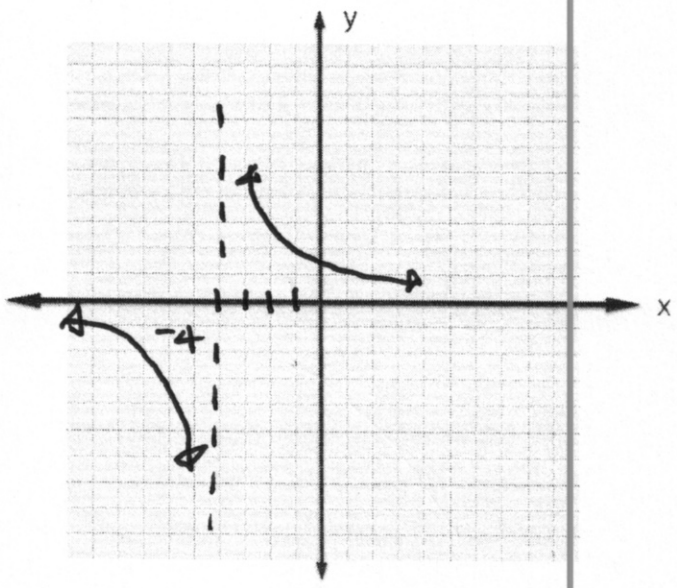
9. $f(x) = -(x+1)^2 - 3$



10. $f(x) = (x-2)^3 - 1$



11. $f(x) = \frac{1}{x+4}$



Use synthetic division to express $f(x)$ in the form $f(x) = (x - k)q(x) + r$ for the given value of k

12. $f(x) = 2x^3 + x^2 + x - 8$ for $k = -1$

13. $f(x) = 4x^4 - 3x^3 - 20x^2 - x - 5$ for $k = 3$

For each polynomial function, use the Remainder Theorem and synthetic division to determine the value of f(k). Also, indicate whether f(k) is a zero for the function polynomial function.

14. $f(x) = 2x^3 - 6x^2 - 9x + 4$ for $k = 1$

15. $f(x) = 4x^4 + x^2 + 17x + 3$ for $k = -\frac{3}{2}$

Use synthetic division to determine whether $x - k$ is a factor for the polynomial function $f(x)$.

16. $f(x) = 2x^4 + 5x^3 - 8x^2 + 3x + 13\ ;\ x + 1$

17. $f(x) = -2x^3 + x^2 - 63\ ;\ x + 3$

Factor each polynomial function, one zero is given. Determine all the other zeros.

18. $f(x) = x^3 - 2x^2 - 5x + 6; 3$

19. $f(x) = 6x^3 + 17x^2 - 31x - 12;\ -4$

20. $f(x) = x^3 + 6x^2 - x - 30;\ -3$

21. $f(x) = x^3 - 2x^2 - 13x - 10; 5$

22. $f(x) = x^3 - 1, 1$

---

23. What is your name?

(12)

-1	2	1	1	-8
		-2	1	-2
	2	-1	2	$\boxed{-10}$

$f(x) = (x+1)(2x^2 - x + 2) - 10$

(13)

3	4	-3	-20	-1	-5
		12	27	21	60
	4	9	7	20	$\boxed{55}$

$f(x) = (x+3)(4x^3 + 9x^2 + 7x + 20) + 55$

(14)

1	2	-6	-9	4	$f(1) = -9$
		2	-4	-13	
	2	-4	-13	$\boxed{-9}$	

(15)

$-\frac{3}{2}$	4	0	1	17	3
		-6	9	-15	-3
	4	-6	10	2	$\boxed{0}$

$f(-\frac{3}{2}) = 0$

(16)

-1	2	5	-8	3	13
		-2	-3	11	-14
	2	3	-11	14	$\boxed{-1}$

$x+1$ is not a factor of f

(17)

-3	-2	1	0	-63
		6	-21	63
	-2	7	-21	0

$x+3$ is a factor of f

(18)

3	1	-2	-5	6
		3	3	-6
	1	1	-2	0

$g(x) = x^2 + x - 2$;

$g(x) = 0$

$x^2 + x - 2 = 0$

$(x+2)(x-1) = 0$

$x = 3$

$x = 1$

$x = -2$

$x+2 = 0$ | $x-1 = 0$

$-2 \quad -2$ | $+1 \quad +1$

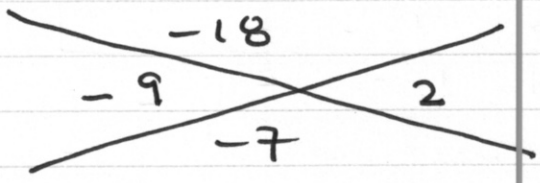
$x = -2$ | $x = 1$

(19)

-4	6	17	-31	-12
		-24	28	12
	6	-7	-3	0

$g(x) = 6x^2 - 7x - 3$; $6x^2 - 7x - 3 = 0$

$6x^2 - 7x - 3 = 0$



$(x - \frac{9}{6})(x + \frac{2}{6}) = 0$

$(x - \frac{3}{2})(x + \frac{1}{3}) = 0$

$(2x - 3)(3x + 1) = 0$

$2x - 3 = 0$	$3x + 1 = 0$	$x = -4$
$+3 \quad +3$	$-1 \quad -1$	$x = 3/2$
$\frac{2x}{2} = \frac{3}{2}$	$\frac{3x}{3} = \frac{-1}{3}$	$x = -1/3$
$x = 3/2$	$x = -\frac{1}{3}$	

(20)

-3	1	6	-1	-30
		-3	-9	30
	1	3	-10	0

$q(x) = x^2 + 3x - 10$; $x^2 + 3x - 10 = 0$

$(x+5)(x-2) = 0$

$x+5=0$ | $x-2=0$

$-5 \quad -5$ | $+2 \quad +2$

$x = -5$ | $x = 2$

(21)

5	1	-2	-13	-10
		5	15	10
	1	3	2	0

$q(x) = x^2 + 3x + 2$

$q(x) = 0$; $x^2 + 3x + 2 = 0$

$(x+2)(x+1) = 0$

$x+2=0$ | $x+1=0$

$-2 \quad -2$ | $-1 \quad -1$

$x = -2$ | $x = -1$

(22)

1	1	0	0	-1
		1	1	1
	1	1	1	0

$q(x) = x^2 + x + 1$; $q(x) = 0$

$x^2 + x + 1 = 0$; $a=1, b=1, c=1$

$x = \dfrac{-1 \pm \sqrt{1^2 - 4 \cdot 1 \cdot 1}}{2 \cdot 1}$

$x = \dfrac{-1 \pm \sqrt{1-4}}{2}$

$x = \dfrac{-1 \pm \sqrt{-3}}{2}$; $\sqrt{3}i$

$x = -\frac{1}{2} \pm \frac{\sqrt{3}}{2} i$