MAT150 College Algebra – Solutions to Class Handouts

Sections 5.1 – 5.2 (not graded)

1.

x	1	2	3	4	5	6
$f(x)$	-5	-3	0	3	7	12
$g(x)=f(x+1)$	-3	0	3	7	12	
$h(x)=f(x-1)$		-5	-3	0	3	7
$j(x)=f(x)+1$	-4	-2	1	4	8	13
$k(x)=f(x)-1$	-6	-4	-1	2	6	11

2.

x	-3	-2	-1	0	1	2	3
$f(x)$	2	-4	-7	8	5	-3	6
$f(-x)$	6	-3	5	8	-7	-4	2
$-f(x)$	-2	4	7	-8	-5	3	-6

3.

x	-3	-2	-1	0	1	2	3
$f(x)$ is EVEN	4	5	-8	0	-8	5	4
$g(x)$ is ODD	4	-5	-8	0	8	5	-4

Section 5.3 – 5.4 (not graded)

1.

x	-4	-2	-1	0	1	2	4	8
$f(x)$	2	4	6	8	10	12	14	16
$2f(x)$	4	8	12	16	20	24	28	32
$\frac{1}{2}f(x)$	1	2	3	4	5	6	7	8
$-2f(x)$	-4	-8	-12	-16	-20	-24	-28	-32
$f(2x)$		2	4	8	12	14	16	
$f(\frac{1}{2}x)$	4	6		8		10	12	14
$f(-2x)$	16	14	12	8	4	2		

2. The point (6, -4) is on the graph of F(x).

F(x)	***F(x + 8)***	***F(x) – 2***	***F(x–3)+5***	***–F(x)***	***F(–x)***	***5F(x)***	***F(3x)***	***F(⅔x)***
(6, -4)	(-2, -4)	(6, -6)	(9, 1)	(6, 4)	(-6, -4)	(6, -20)	(2, -4)	(9, -4)

3. G(x) has domain -2 < x < 9 and range -4 < F(x) < 1.

Function	Domain	Range
F(x)	-2 < x < 9	-4 < F(x) < 1
G(x) = F(x – 3)	1 < x < 12	No change
G(x) = F(x) – 3	No change	-7 < G(x) < -2
G(x) = –F(x)	No change	-1 < G(x) < 4
G(x) = F(–x)	-9 < x < 2	No change
G(x) = 3F(x)	No change	-12 < G(x) < 3
G(x) = F(3x)	-2/3 < x < 3	No change

Sections 5.1 – 5.4

3. $f(-x) = f(x)$ 4. ln(x + 3) + 1

5.

x	**-2**	**-1**	**0**	**1**	**2**	**3**
$f(x)$	-5	11	2	-3	7	9
$g(x)=f(x+1)$	11	2	-3	7	9	
$h(x) = f(2x)$		-5	2	7		
$j(x)=f(-x)+1$	8	-2	3	12	-4	
$k(x) = -3f(-x)$	-21	9	-6	-33	15	

6. The point (2,5) is on the graph of $y = f(x)$.

Function	***f* (*x* – 4)**	***f* (*x*) – 4**	***f* (–*x*)**	***f* (4*x*)**	***f* (*x* + 3) – 1**	**–0.4*f* (*x*)**
Coordinates of Point	(6, 5)	(2, 1)	(-2, 5)	(1/2, 5)	(-1, 4)	(2, -2)

7. Suppose a function G(x) has domain -4 < x < 6 and range -8 < G(x) < 12.

Function	**Domain**	**Range**
G(x)	-4 < x < 6	-8 < G(x) < 12
H(x) = G(-x)	-6 < x < 4	No change
K(x) = G(2x)	-2 < x < 3	No change
M(x) = 4G(x)	No change	-32 < G(x) < 48
Q(x) = G(x + 3) – 1	-7 < x < 3	-9 < G(x) < 11

Section 5.5

1. a. (0, -30) b. x = 5, x = -3 c. up d. (1, -32)
   e. All real numbers f. $f(x) \geq -32$ g. x=1 h. $f(x) = 2(x-1)^2 - 32$

2. a. (0, 1) b. $x = \frac{4 \pm \sqrt{24}}{4} = \frac{2 \pm \sqrt{6}}{2}$, $x \approx 0.225$, $x \approx -2.225$ c. down
   d. (-1, 3) e. All real numbers f. $f(x) \leq 3$ g. x = -1
   h. $f(x) = -2(x - 0.225)(x + 2.225)$

3. a. (0, -24) b. x = -2, x = 4 c. up d. (1, -27)
   e. All real numbers f. $f(x) \geq -27$ g. x = 1 h. x < 1
   i. $f(x) = 3x^2 - 6x - 24$

4. $y = \frac{1}{4}(x-4)^2 + 2 = \frac{1}{4}x^2 - 2x + 6$
5. a. (0, 4) The ball was 4 feel high when hit. b. 2.5 seconds c. 104 feet
   d. 5.05 seconds

Section 8.1 – 8.3 (not graded)

1. a. YES b. 0 c. 40 d. 8 e. 40 f. 11
   g. 8 h. –3 i. 81

2. a. $-9x^2 + 3x + 2$ b. $27x^2 - 87x + 71$ c. $9x - 10$
   d. $3x^2 + 2x - 4$ e. $g^{-1}(x) = \frac{x-5}{-3} = \frac{5-x}{3}$ f. $\frac{1}{5-3x}$

3. $f^{-1}(x) = 2^x - 3$ 4. $g^{-1}(x) = \frac{\ln x - 5}{3}$ 5. $h^{-1}(x) = \frac{x^2}{4}$

6. False, If $f(g(x)) = g(f(x)) = x$, then f and g must be inverses of each other
   False, Only a ONE-TO-ONE function has an inverse
   True

7. A car travelling at 30 miles per hour can come to a complete stop in 55 feet.
   A car travelling at 25 miles per hour can come to a complete stop in 40 feet.