

Answer Key to 518 Midterm Review

**A. Functions**

1. 71      2.  $y = \frac{1}{2}x + \frac{1}{2}$       3. a)  $f(g(3)) = 29$       b)  $g(f(x)) = 8x - 1$
4. a)  $4x + 1$       b)  $2x + 7$       c)  $\frac{3x + 4}{x - 3}, x \neq 3$       d)  $3x^2 - 5x - 12$
5. a) yes      b) no
6. Answers vary
7. a)  $f(3) = 2$       b)  $x = -3$
8. Left) D:  $-2 \leq x < 1$       R:  $-1 \leq y \leq 4$   
Right) D:  $1 < x \leq 4$       R:  $1 < y \leq 4$

**B. Quadratics**

1.  $x = 8$  or  $-5$
2.  $x = 5$  or  $-5$
3.  $x = 2\sqrt{10} - 5$  or  $-2\sqrt{10} - 5$  are exact answers  
1.32 and  $-11.32$  are the decimal approximations
4. a) zeros (roots) = 5 or 1  
b) axis of symmetry:  $x = 3$   
c) vertex: (3, -4)  
d) table: **Answers will vary.**  
Possible values:
- |   |    |   |    |    |   |
|---|----|---|----|----|---|
| X | -1 | 0 | 2  | 4  | 6 |
| Y | 12 | 5 | -3 | -3 | 5 |
5. a) 5.75 seconds      b) 529 feet      c)  $f(1) = 168$  ft      d) 11.5 seconds

### C. Sequences and Series

1. a)  $t_1 = 4, t_2 = 13, t_3 = 28, t_4 = 49$

b)  $a_1 = -2, a_2 = 1, a_3 = 10, a_4 = 37$

2.  $t_n = 25 - 6(n - 1)$

3. 60

4.  $t_{23} = 73$

5. a)  $t_{13} = 20,480$       b)  $S_{10} = 5,115$

6. Four arithmetic means: 34, 28, 22, 16

10. 1,245

9.  $n = 29$  so...  $S_{29} = -638$

10.  $t_n = 7,550 - 725(n - 1)$

### D. Exponents

1.  $\frac{3x^3}{5z^3}$       2. (a)

3. a)  $8x^6$       b)  $15x^5y^5$       c)  $\frac{3}{x^2}$       d) 4