Math 1314 − College Algebra ***Exam* 1 *Review***

1. Use the binomial theorem to expand and simplify:

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1. Determine whether each relation is a function and find the domain and the range.
2. 
3. 
4. 
5. Given , find:

*a*)  *b*)  *c*)  *d*) 

1. For , determine

|  |  |  |  |
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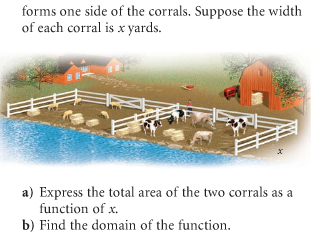
1. Solve the following equations:

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1. Solve the following inequalities and express the solutions in interval notation.

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1. For , find
2. Find the vertex point
3. Find the line of symmetry
4. State whether there is a maximum or minimum value *and* find that value
5. Find the zeros of 
6. Find the range and the domain of the function.
7. Graph the function and ***label.***
8. On what intervals is the function increasing? Decreasing?
9. For , find
10. Find the vertex point
11. Find the line of symmetry
12. State whether there is a maximum or minimum value *and* find that value
13. Find the zeros of 
14. Find the range and the domain of the function.
15. Graph the function and ***label.***
16. On what intervals is the function increasing? Decreasing?
17. The height of a projectile fired upward from the ground with an initial velocity of 128 *ft./s* is given by , where *s* is the height in *feet* and *t* is the time in *seconds*. Find the times at which the projectile will be 192 *feet* above the ground.
18. A rancher has 360 *yd.* of fencing with which to enclose two adjacent rectangular corrals, one for sheep and one for cattle. A river forms one side of the corrals. Suppose the width of each corral is *x* yards.



1. Express the total area of the two corrals as a function of *x*.
2. Find the domain of the function.
3. Find the maximum area
4. Find the dimensions that maximize the corrals area
5. A projectile is fired vertically upward, and its height  in feet after *t* seconds is given by the function defined by 
   * + 1. From what height was the projectile fired?
       2. After how many seconds will it reach its maximum height?
       3. What is the maximum height it will reach?
6. A ball is thrown upwards, and its height *s* at time *t* can be determined by the function , where *s* is measured in feet above the ground and *t* is the number of seconds of flight. Find:

*a*) The time it takes the ball to reach its maximum height.

*b*) The maximum height the ball attains.

1. The period *T* of the pendulum is the time it takes the pendulum to complete one swing from left to right and back. For a pendulum near the surface of Earth



Where *T* is measured in *seconds* and *L* is the length of the pendulum in *feet*. Find the length of a pendulum that has a period of 4 *seconds*.

1. If a projectile is launched from ground level with an initial velocity of 96 *feet* per *sec*, its height in feet *t* *seconds* after launching is *s* *feet*, where



When will the projectile be greater than 80 *feet* above the ground?

1. You can rent a car for the day from Company ***A*** for $29.00 plus $0.12 a *mile*. Company ***B*** charges $22.00 plus $0.21 a *mile*. Find the number of miles *m* per day for which it is cheaper to rent from Company ***A***.

***Solution***

1. 







1. *a*) 

*b*) 

*c*) 

1. *a*) 6 *b*)  *c*) 0 *d*) 
2. *a*)  *b*)  *c*)  *d*) 
4. 
5. 
6. 
7. 
8. 
9. 
10. 
11. 
12. 
13. 
14. 
15. 
16. 
17. 

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1. Vertex:  







Vertex point: 

Axis of symmetry: 

Maximum point @ 

*x*-intercept: 

*y*-intercept: 

Domain: 

Range: 

Increasing: 

Decreasing: 

1. Vertex: 



Vertex point: 

Axis of symmetry: 

Maximum point @ 

*x*-intercept: 

*y*-intercept: 

Domain: 

Range: 

Increasing: 

Decreasing: 

1. *t* = 2 and 6 *sec*. height 192 *ft*
2. *a*)  *b*) Domain: 0 < *x* < 120 *c*)  *d*) 60 by 180 *yd*.
3. *a*) Height = 600 *ft*. (*t* = 0) *b*) *t* = 25 sec. *c*) Max. Height: 10,600 *feet*.
4. *a*) *t* = 1.5 secs *b*) Max height is 44 *feet*.
5. 
6. ******
7. 