

Review for Comprehensive Test #1 on Thurs. Mar. 30

Topic 1 - System of Linear Inequalities (Ch. 6)

EXTRA = Extra questions on the back relating to that concept

Concept #	Concept	Review Questions
1	6. 1 Graph , determine and verify algebraically the solution to a single linear inequality	Pg 349 #1 Pg 520 #1,2
2	6.2/3 Graph a system of linear inequalities, find and verify solutions. Also be able to write a system of inequalities given a graph.	Pg 323 #5a, Pg 349 #6
3	6.2/3 Write an inequality or a system of inequalities to match a given situation, find its domain, range and restrictions, graph the system, find a solution and be able to describe what the solution represents.	Pg 349 #3
4	6.4-6.6 Solve an optimization problem given just the situation. Justify and explain feasible regions, coordinates of vertices and other parts of optimization problems	Pg 347 #3, 4, Pg 350 #11 Pg 520 #3 EXTRA

Topic 2- Quadratic Functions(Ch. 7)

Concept #	Concept	Review Questions
5	7.2 Be able to graph a quadratic function using a table of values	Pg 443 #1 Pg 370 #7ab
6	7.2 Given the graph of a quadratic function in standard form find the: vertex, equation of the axis of symmetry, domain and range and max or min. 7.2 Given the x- intercepts or two symmetrical points find the equation of the axis of symmetry.	EXTRA
7	7.5 Solve a quadratic equation by factoring(Determine the roots) and graph	Pg 520 #4 Pg 521 #10 Pf 443 #8
8	7.4 Write a quadratic equation in standard form given the zeros/x-intercepts or graph of a quadratic function.	Pg 521 #7 Pg 440 #4
9	7.7 Solve a quadratic equation using the quadratic formula/determine the x intercepts of a parabola using the quadratic formula	Pg 444 #13
10	7.5/7.7/7.8 Solve a situational problem modelled by a quadratic function with or without a graphing calculator in standard form	Pg 521 #11 Pg 440 #3, 8 Extra
11	7.6 Given Vertex form determine: vertex, x and y intercepts, domain and range, equation of the axis of symmetry, opens up or down, max or min and then be able to graph.	Pg 520 #5 Pg 443 #9
12	7.6 Determine the equation in vertex form of a parabola given its graph	EXTRA
13	7.6 /7.8 Solve a situational problem modelled by a quadratic function using vertex form.(Including domain and range implications)	Pg 444 #12

Topic 3 – Inductive and Deductive Reasoning (Ch.1)

Concept #	Concept	Review Questions
14	1.1 Make a conjecture by observing patterns and identifying properties	Pg 110 #1, 5a, 7
15	1.4/5 Prove algebraic number relationships and conjectures and identify errors in proof	Pg 110 #5b, 6, 8 Pg 61 #9 -13
16	1.2/3 Analyze an argument for its validity and provide counterexamples to a conjecture with false conclusions	Pg 110 #3 Pg 61 #5,6, 7

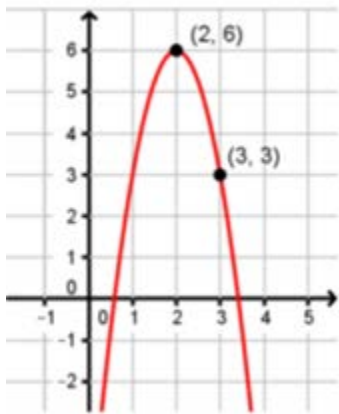
Extra Practice Questions:**Concept #10 (May use graphing calculator or solve algebraically)**

- a) While playing catch with his grandson yesterday Tim throws a ball as hard as possible into the air. The height h in feet of the ball is given by $h = -16t^2 + 64t + 8$, where t is in seconds. How long will it take until the ball reaches the grandson's glove if he catches it at a height of 3 feet? What is the maximum height of the ball?
- b) A ball rolls down a slope and travels a distance $d = 6t + \frac{t^2}{2}$ feet in t seconds. Find when the distance is 17 feet.
- c) The path of a high diver is given by $y = -\frac{4}{9}x^2 + \frac{24}{9}x + 10$ where y is the height in feet above the water and x is the horizontal distance from the end of the diving board in feet. What is the maximum height of the diver and how far out from the end of the diving board is the diver when he hits the water?

Concept #4

- a) The stylists in a hair salon cut hair for women and men.
- The salon books at least 5 women's appointments for every man's appointment.
 - Usually there are 90 or more appointments, in total, during a week.
 - The salon is trying to reduce the number of hours the stylists work.
 - A woman's cut takes about 45 min, and a man's cut takes about 20 min.
- What combination of women's and men's appointments would minimize the number of hours the stylists work? How many hours would this be?
- b) On a flight between Calgary and Thunder Bay, there are business class and economy seats.
- At capacity, the airplane can hold no more than 133 passengers.
 - No fewer than 124 economy seats are sold, and no more than 5 business class seats are sold.
 - The airline charges \$624 for business class seats and \$239 for economy seats.
- What combination of business class and economy seats will result in the maximum revenue? What will this maximum revenue be?
- c) A zoo has categorized its exhibits as herbivores and carnivores.
- There are no more than 80 exhibits altogether.
 - No more than 75% of the exhibits are herbivores, and no less than 40% are carnivores.
 - A ticket to any herbivore exhibit costs \$10, and a ticket to any carnivore exhibit costs \$12.
- What combinations of herbivore and carnivore exhibits would maximize the zoo's revenue?

Concept # 12 a) Determine the equation in vertex form
form



Concept #6

a) Using the graph From concept #8(a) find the following:

Vertex:

Equation of axis of symmetry:

Domain:

Range:

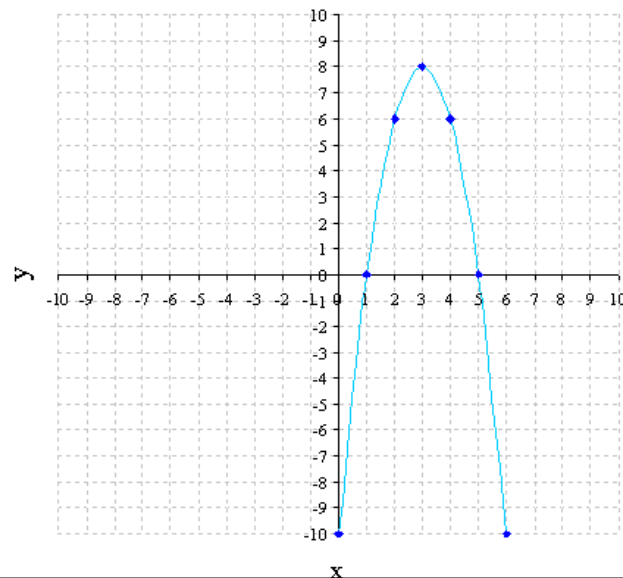
Max or min ? Value?

b) For each of the following , both points are located on the same parabola.

Determine the axis of symmetry

i) (3, 6) and (-9, 6) ii) ($\frac{1}{2}, 5$) and ($\frac{1}{4}, 5$)

Concept #8 a) Determine the quadratic function of the following graph in standard



Solutions to EXTRAS

Concept #10a) 4.077 secs ; 72 ft b) 2.367 secs c) 14 ft; 8.612 ft

Concept #12 a) $y = -3(x - 2)^2 + 6$

Concept #8 a) $y = -2x^2 + 12x - 10$

Concept #6 a) vertex (3,8) ; $x=3$; $D = \{x | x \in \mathbb{R}\}$; $R = \{y | y \leq 8, y \in \mathbb{R}\}$; Max at 8

b) i) $x = -3$ ii) $x = \frac{3}{8}$

Concept #4(Solutions) a)

Let x represent the number of women's appointments.

Let y represent the number of men's appointments.

Let T represent the total time.

Restrictions:

$$x \in W, y \in W$$

Constraints:

$$x \geq 5y$$

$$x + y \geq 90$$

Objective function to minimize:

$$E = 45x + 20y$$

The intersection points are $(90, 0)$ and $(75, 15)$.

The minimum occurs when x is minimized.

The minimum is at point $(75, 15)$ and represents 75 women's appointments and 15 men's appointments.

$$E = 75(45) + 20(15)$$

$$E = 3675$$

The minimum amount of time is 3675 h.

b)

Let x represent the number of economy seats.

Let y represent the number of business class seats.

Let R represent the revenue.

Restrictions:

$$x \in W, y \in W$$

Constraints:

$$x + y \leq 133$$

$$x \geq 124$$

$$y \leq 5$$

Objective function to maximize:

$$R = 239x + 624y$$

The intersection points are $(124, 0)$, $(124, 5)$, $(128, 5)$, and $(133, 0)$.

The maximum will occur when y is maximized.

The maximum is at point $(128, 5)$, which represents 128 economy seats and 5 business class seats.

$$R = 239(128) + 624(5)$$

$$R = 33\,712$$

The maximum revenue is \$33 712.

c) Let x represent the number of herbivore exhibits.

Let y represent the number of carnivore exhibits.

Let R represent the revenue.

$$x \in W, y \in W$$

$$x \leq 60$$

$$y \leq 32$$

$$x + y \leq 80$$

Objective function to maximize:

$$R = 10x + 12y$$

If there were 48 herbivore exhibits and 32 carnivore exhibits this would maximize the zoo's revenue with a profit of \$864.