

Unit 9: Quadratic Functions and Transformations

Chapter 9, page 382

Study guide

The purpose of this guide is to help you organize the material we covered in this unit, remind you of the work we did, suggest additional problems for practice, and describe the format of the unit-test.

There are 3 parts to this guide:

1. Subjects covered – Also includes the homework and worksheets we did.
2. Test format.
3. Warm-up drills.

1. Subjects covered

Function and transformations

(Sections 9-1, 9-2, 9-3 in the book)

- Even and Odd functions.
- Function types: Linear, quadratic, cubic, absolute value, radical, rational, floor.
- Vertical and Horizontal translations.
- Vertical and Horizontal stretching.

** Worksheet-packet we did (are doing) in class: "Math Lab: Transformations of Parent Graphs".

Graphs of Quadratic functions

(Sections 9-4, 9-5,9-6,9-7)

- Using 'Vertex' form: $f(x) = a(x - h)^2 + k$.
- Analyzing the vertex form: Vertex, symmetry.
- Relation to standard form $ax^2 + bx + c$.
- X intercepts, Y intercepts .
- Factored form .

** Worksheet (double-sided page) we did in class: " Fun Multiple Graphs".

** Page 402: 3, 4, 16,17,18

** Page 406, Questions 9,11

** Pages 410-411 Questions 1,3,9

Word problems

(Sections 9-8, 9-9)

- Maximum/Minimum ==> Worksheet we did in class.
- Fitting to a quadratic equation: This is the way you found 'a' in the worksheet.
- Solving vertical motion problems: We already did in previous unit of quadratic equations.

** Worksheet we did in class: "Quadratic equations, minimum/maximum, word problems." The last item on this worksheet was the 'dog' question.

** Page 410-411, Questions 13,17, 28

Important:

Lines, Quadratic equations

You will need to know the equation for a line ($y = mx + b$), and manipulations of it. For example, a line through two points, a line with a slope through a point, etc.

2. Test format

1. This will be a take home test, with closed material.

2. The following is excerpt from the test directions:

" This is a take home test. You may take as long as you wish on the test and continue the test over multiple sittings. Once the test is started you may not use the book or materials from class nor discuss with, receive hints from or enlist the help of parents, siblings, other students or anyone else to do the test or check your work. The test is due to Dr. Baharav at (Specifics will follow here on the real test).

After finishing the test, both the student and one parent/guardian should sign this sheet, confirming adherence to the rules, and return it and the test still stapled together."

3. There will be 10 questions, each worth 3 points.

a. Three questions on transformations and even/odd functions.

b. Three questions on graphing, vertex, intercepts, etc.

c. Three questions on word problems.

d. One question which combines understanding of graphs, lines, and intersection of graphs.

4. You are allowed to use graphic calculator or similar tools (Desmos.com for example). BUT, as stated above, you are not allowed to surf the internet looking for definitions/graphs etc.

5. If you plan or wish to use any additional resources or accommodations, please let me know (in person or schoology). For example, use of a reader for the word-problems.

3. Warm-up Drills

Every class we solved one (or more) warm-up problems. Some are harder than others.

I believe each one of those gives an additional insight into the material. Attached are the slides copy. I would highly recommend to look at these and verify you understand how to solve each one. We did solve all of these in class! (so you should have the solution).

In this unit, some of the warm-ups were Word-problems which are definitely part of the material expected.

Word problem: Warm up

Driving on a motorway, the sign said

“Speed limit 60; Average speed calculated”.

I noticed that I was driving 80mph for the last 10 minutes.

1. Easier: How long do I have to go at 40mph to be legal?
2. Harder: How long do I have to go at 50mph to be legal?

Word problems: 1

What are the dimensions of the largest rectangular yard that can be enclosed with 64 meters of fence?

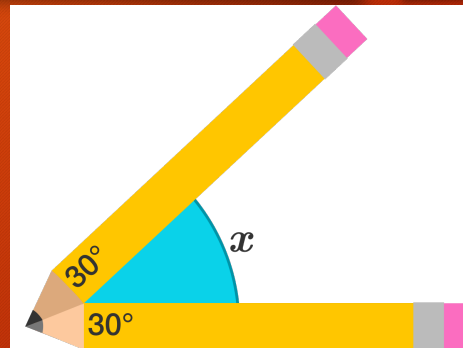
Word problems:2

One hundred feet of fencing of fence is available to make a rectangular door pen against a wall. What are the dimensions of the pen that will yield the maximum area?

Geometry

If the angle of each pencil tip in diagram is 30° , then what is the measure of x ?

In this flat diagram, each identically shaped pencil is formed by a rectangle attached to an isosceles triangle.



(A) 20°

(B) 30°

(C) 40°

(D) 45°

(E) 50°

Credit: Brilliant.org

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