Unit 8: Quadratic Equations

Study guide: Part I/II

This is part I (of II). The second part is a practice test.
The purpose of this guide is to help you organize the material we covered this unit, some of the more challenging problems we had, AND some extra guidance and suggestion for learning.

Homework

Below are all the homework assignments we had on this chapter.
You should be thoroughly familiar with these. This means, for example, that you should know how to get to the solution of each, AND do it at the right level (time and effort: Use known formulas rather than FOIL automatically). Also, we did many examples in class. Hopefully you have a record of these (in memory, writing, or pictures).

--Complete the square
Page 345: 1,5,19,25
Page 346: 39,41,43,45,46
--Quadratic formula
Page 352 , Questions 3,5,11,13,21
-- Solutions properties + Word problems
Properties of solutions:
Page 357 Questions 17,21,31,33,35
Word problems:
Page 349, Questions 1,8,9 H: 12
-- Substitution + Pythagoras
Page 361 questions 1,3,7,9
Page 349, questions 5,7
H: Page 365, question 29
--Formulas + Vertical motion
Page 364, Questions 3,7,11
Worksheet on vertical motion.

Warm-up Drills and Warm-up challenges

Every class we solved one (or more) warm-up problems. Some are harder than others.
There are no 'Warm-up' level questions in the test in general, but 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).

Warm up slides and Drills

Timed warm-up (6 minutes)

1. Solve using factoring (MATH, box, or similar).

$4x^2 - 10x + 4 = 0$ $4x^2 - 7x + 3 = 0$

2. Solve using completing the square.

$x^2 - 4x + 1 = 0$ $y^2 + 7y + 12 = 0$

3. Solve using the quadratic equation formula.

$u^2 = 6u - 2$ $x^2 + x + 2 = 0$

Powers/Quadratics

Unit 8-9
Quadratics

Find the sum of all solutions to the equation

$$(x^2 + 5x + 5)^{x^2 - 10x + 21} = 1.$$

(A) 0 (B) 1 (C) 2 (D) 5 (E) 10

Credit: Brilliant.org

Quadratics

Unit 8-9
Quadratics

$$x + \frac{1}{x} = 5, \qquad x^2 + \frac{1}{x^2} = ?$$

(A) 23 (B) 24 (C) 25 (D) 26 (E) 27

Credit: Brilliant.org

Quadratics

Unit 8-9
Quadratics

Thomas, having mowed a large rectangular plot of grass, estimates the area to be 400 square feet. Elva walks around the plot and estimates the perimeter to be 100 feet.

Find the approximate dimensions of the plot.

Class questions

Bicyclists A and B leave the same point P at the same time at right angles. B travels 7 km/h faster than A.

After 3 hours they are 39 km apart.

Find the speed of each.

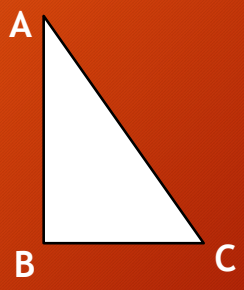
Class questions

A ladder is two feet longer than the height of a certain wall. When the top of the ladder is placed against the top of the wall, the distance from the base of the ladder to the wall is exactly equal to the height of the wall.

How high is the wall?

Pythagorean

Right triangle ABC with AC = 2, AB+BC=$\sqrt{6}$. Find the area of $\triangle ABC$.

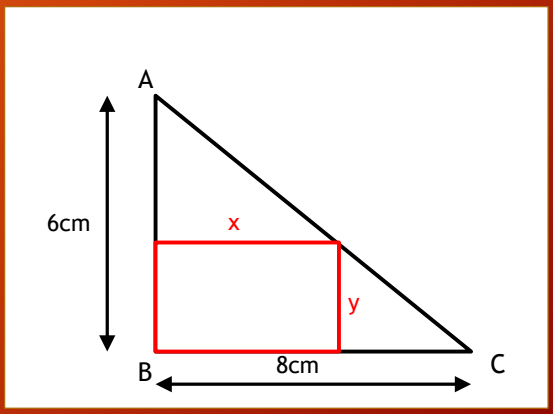


(A) $\frac{1}{2}$ (B) $\frac{3}{4}$ (C) $\frac{3}{5}$ (D) $\frac{3}{8}$ (E) $Other$

Pythagorean : Not easy

A rectangle of 12-cm^2 area is inscribed in the right triangle ABC as shown in the drawing.

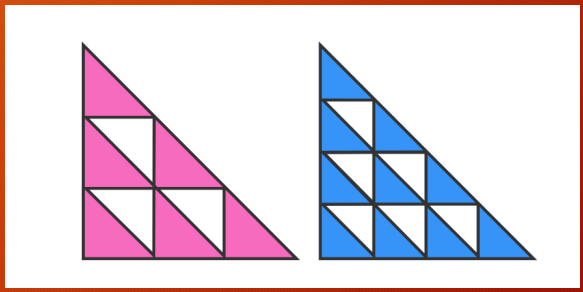
What are its dimensions?



Geometry?

The large triangles are identical. Which is larger, the pink area on the left or the blue area on the right?

All internal triangles are similar to the larger triangles.



(A) Pink (B) Blue (C) Equal

Warm-up complete the square

Unit 8-9
Quadratics

- Solve by completing the square:

- $x^2 - 4x + 1 = 0$

- $\frac{1}{2}y^2 - 3y + 9 = 0$

====END===