First name: _____ Last name: _____

Quadratic Equations (2) Homework

1. Use the discriminant to determine the nature of each quadratic equation's roots.

1. $5x^2 + 11x = -2$	2. $1\frac{2}{3}x^2 - 1\frac{1}{3}x = -2\frac{1}{3}x$	3. $9x^2 + 12x + 4 = 0$

2. Use the quadratic formula to solve each equation.

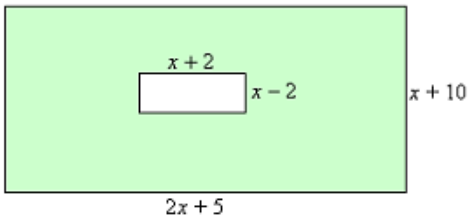
1. $-9x^2 - 12x + 5 = 0$	2. $3x^2 - x - 8 = 0$	3. $7x^2 - 11x - 12 = 0$

4. $3x^2 + 6x - 3 = 5x^2 + 5x$	5. $7\frac{1}{2}x^2 - 13\frac{1}{2}x = 15$	6. $28x^2 - 2\frac{4}{5} = -5\frac{3}{5}x$

Word problems:

1. A rectangular field is going to be completely enclosed by 100 m of fencing. Create a quadratic relation that shows how the area of the field will depend on its width. Then determine the dimensions of the field that will result in an area of 575 m^2. Round your answers to the nearest hundredth of a metre.

2. Write an equation for the shaded area in the following diagram if the shaded area is 150 square unit. Then solve for x.



3. A square lawn is surrounded by a concrete walkway that is 2 m wide. If the area of the walkway equals the area of the lawn, what are the dimensions of the lawn? Round it to the nearest tenth of a metre.

4. Determine the quadratic equation, in standard form, that has each pair of roots.

a) x = -3, x = 5

b) $x = \frac{2 \pm \sqrt{5}}{3}$

5. For what value(s) of k does the equation $y = 5x^2 + 6x + k$ have each number of roots?

a) 2 real roots

b) one real root

c) no real roots

6. A tangent is a line that touches a circle at exactly one point. For what values of k will the line $y = x + k$ be tangent to the circle $x^2 + y^2 = 25$?

7. A water balloon is catapulted into the air so that its height h, in metres, after t seconds is $h = -4.9t^2 + 27t + 2.4$

a) How high is the balloon after 1 second?

b) For how long is the balloon more than 30 m high?

c) What is the maximum height of the balloon?

d) When will the balloon burst as it hits the ground?

8. Solve the equation $x = \sqrt{x + 2}$.