

## Seventeenth Set of Homework for Math 05

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**Please note:** You should fully justify your answers.

### 1 Using the quadratic formula

Solve each of the following equations using the quadratic formula.

- $x^2 + 4x - 21 = 0$       $x = 3, x = -7$
- $x^2 - 3x - 2 = 0$       $\frac{3 \pm \sqrt{17}}{2}$
- $x^2 - 5 = 0$       $x = \pm\sqrt{5}$
- $x^2 + 3x = 0$       $x = -3, x = 0$
- $4x^2 - 3x + 7 = 0$      No real solutions
- $12x^2 + 4x = 1$       $x = \frac{1}{6}, x = -\frac{1}{2}$
- $12x^2 + 13x - 4 = 0$       $x = -\frac{4}{3}, x = \frac{1}{4}$
- $5x^2 + 3x = 11$       $x = \frac{3 \pm \sqrt{229}}{10}$
- $-2x^2 - 7x + 3 = 0$       $x = -\frac{7 \pm \sqrt{73}}{4}$
- $24x^2 - 5x + 5 = 3x + 20$       $x = \frac{2 \pm \sqrt{94}}{12}$
- $8x^2 - 11x - 13 = 3x^2 - 15x - 8$       $x = \frac{2 \pm \sqrt{29}}{5}$

### 2 The meaning of discriminant

- Find the real number  $b$  so that the following equation:

$$9x^2 + bx + 25 = 0$$

has exactly one (double) real solution.      $b = \pm 30$

- For which real numbers  $a$  the equation  $ax^2 - 4x + 7 = 0$  has real solutions?      $a < \frac{4}{7}$

- For which real numbers  $c$  the equation:

$$3x^2 - 5x + c = 0$$

has no real solutions?      $c < \frac{25}{12}$

- Find the real number  $a$  if the equation:  $ax^2 - 12x + 2a + 1 = 0$  has a double solution.      $a = 4$  or  $a = -\frac{9}{2}$