

Exercises A.6.97 and A.6.105

A.6.97 Use the quadratic formula to solve
 $2x^2 - 5x + 3 = 0$.

Solution

In $2x^2 - 5x + 3 = 0$, we have $a = 2$, $b = -5$, $c = 3$.
 So the quadratic formula gives the solutions

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(2)(3)}}{2(2)}$$

$$= \frac{5 \pm \sqrt{25 - 24}}{4} = \frac{5 \pm \sqrt{1}}{4} = \frac{5 \pm 1}{4}$$

So $x = 4/4 = 1$ or $x = 6/4 = 3/2$.
 The solution set is $\{1, 3/2\}$. \square

A.6.105 Use the discriminant to determine whether $x^2 - 5x + 7 = 0$ has two unequal real solutions, a repeated real solution, or no real solutions without solving the equation.

Solution

In $x^2 - 5x + 7 = 0$, we have $a = 1$, $b = -5$, $c = 7$.
 So the discriminant is

$$b^2 - 4ac = (-5)^2 - 4(1)(7) = 25 - 28 = -3 < 0.$$

So by Note A.6.C, there are

no real solutions. \square