Gateway Exam #1 Practice Problems
The Quadratic Formula

1. The roots of the polynomial $x^2 - x - 1$ are:
   (a) $x = \dfrac{1+\sqrt{5}}{2}$ and $x = \dfrac{1-\sqrt{5}}{2}$
   (b) $x = 1+\sqrt{5}$ and $x = 1-\sqrt{5}$
   (c) $x = \dfrac{1+\sqrt{5}}{2}$ only
   (d) $x = \dfrac{-1+\sqrt{5}}{2}$ and $x = \dfrac{-1-\sqrt{5}}{2}$
   (e) The given polynomial has no real roots.

2. The roots of the polynomial $-x^2 + 4x + 1$ are:
   (a) $x = -2+\sqrt{5}$ and $x = -2-\sqrt{5}$
   (b) $x = -4+2\sqrt{5}$ and $x = -4-2\sqrt{5}$
   (c) $x = 4+2\sqrt{5}$ and $x = 4-\sqrt{5}$
   (d) $x = 2+\sqrt{5}$ and $x = 2-\sqrt{5}$
   (e) The given polynomial has no real roots.

3. The roots of the polynomial $x^3 + 2x^2 + 2x$ are:
   (a) $x = 0$ and $x = -2$
   (b) $x = 0$ and $x = -1+\sqrt{3}$ and $x = -1-\sqrt{3}$
   (c) $x = -1+\sqrt{3}$ and $x = -1-\sqrt{3}$
   (d) $x = 0$ only
   (e) The given polynomial has no real roots.

4. The roots of the polynomial $x^2 + 4x + 9$ are:
   (a) $x = -2+\sqrt{13}$ and $x = -2-\sqrt{13}$
   (b) $x = -2+\sqrt{13}$ only
   (c) $x = -2+\sqrt{5}$ and $x = -2-\sqrt{5}$
   (d) $x = \dfrac{-2+\sqrt{5}}{2}$ and $x = \dfrac{-2-\sqrt{5}}{2}$
   (e) The given polynomial has no real roots.

5. The roots of the polynomial $4x^2 + 4x - 3$ are:
   (a) $x = 2$ and $x = -12$
   (b) $x = \frac{1}{2}$ and $x = -\frac{3}{2}$

(c) $x = \frac{1}{2}$ only

(d) $x = \frac{3}{2}$ and $x = -\frac{1}{2}$

(e) The given polynomial has no real roots.

6. The roots of the polynomial $3x^2 + x + 2$ are:

(a) $x = -1$ and $x = \frac{2}{3}$

(b) $x = \dfrac{-1 + \sqrt{23}}{6}$ and $x = \dfrac{-1 - \sqrt{23}}{6}$

(c) $x = \dfrac{-1 + \sqrt{23}}{2}$ and $x = \dfrac{-1 - \sqrt{23}}{2}$

(d) $x = \dfrac{-1 + \sqrt{23}}{6}$ only

(e) The given polynomial has no real roots.

7. The roots of the polynomial $2x^2 + x - 7$ are:

(a) $x = \dfrac{-1 + \sqrt{57}}{2}$ and $x = \dfrac{-1 - \sqrt{57}}{2}$

(b) $x = \dfrac{1 + \sqrt{57}}{4}$ and $x = \dfrac{1 - \sqrt{57}}{4}$

(c) $x = \dfrac{-1 + \sqrt{57}}{4}$ and $x = \dfrac{-1 - \sqrt{57}}{4}$

(d) $x = \dfrac{1 + \sqrt{57}}{2}$ only

(e) The given polynomial has no real roots.

8. The roots of the polynomial $2x^2 + 2x - 1$ are:

(a) $x = \dfrac{-1 + \sqrt{3}}{2}$ and $x = \dfrac{-1 - \sqrt{3}}{2}$

(b) $x = \dfrac{1 + \sqrt{3}}{2}$ and $x = \dfrac{1 - \sqrt{3}}{2}$

(c) $x = -1 + \sqrt{3}$ and $x = -1 - \sqrt{3}$

(d) $x = \dfrac{1 + \sqrt{3}}{2}$ only

(e) The given polynomial has no real roots.

9. The roots of the polynomial $3x^2 - 11$ are:

(a) $x = \dfrac{2\sqrt{33}}{3}$ and $x = -\dfrac{2\sqrt{33}}{3}$

(b) $x = \dfrac{\sqrt{33}}{3}$ and $x = -\dfrac{\sqrt{33}}{3}$

(c) $x = 0$ and $x = \frac{11}{3}$

(d) $x = \sqrt{\frac{11}{3}}$ only

(e) The given polynomial has no real roots.

10. The roots of the polynomial $-x^2 - 2x - 3$ are:

(a) $x = -1 + \sqrt{2}$ and $x = -1 - \sqrt{2}$

(b) $x = -1 + \sqrt{2}$ only

(c) $x = -1 - \sqrt{2}$ only

(d) $x = -3$ and $x = 1$

(e) The given polynomial has no real roots.

Answers:

1.	a	2.	d	3.	d	4.	e	5.	b
6.	e	7.	c	8.	a	9.	b	10.	e