

A2.A.25: Quadratics with Imaginary Solutions: Solve quadratic equations, using the quadratic formula

1 The roots of the equation $x^2 - 4x + 9 = 0$ are

- 1) $2 \pm i\sqrt{5}$
- 2) $2 \pm \sqrt{5}$
- 3) $2 \pm i\sqrt{13}$
- 4) $2 \pm \sqrt{13}$

2 The roots of the equation $x^2 - 3x + 7 = 0$ are

- 1) $\frac{3 \pm \sqrt{19}}{2}$
- 2) $\frac{3 \pm i\sqrt{19}}{2}$
- 3) $3 \pm \frac{\sqrt{19}}{2}$
- 4) $3 \pm \frac{i\sqrt{19}}{2}$

3 The roots of the equation $3x^2 - 4x + 2 = 0$ are

- 1) $\frac{1 \pm \sqrt{2}}{3}$
- 2) $\frac{2 \pm i\sqrt{2}}{3}$
- 3) $\frac{2 \pm \sqrt{10}}{3}$
- 4) $4 \pm \frac{i\sqrt{2}}{3}$

4 Solve for x in simplest $a + bi$ form: $x^2 + 8x + 25 = 0$

5 Solve for x and express in simplest $a + bi$ form:
 $3x^2 - 6x + 4 = 0$

6 Solve the equation for x and express the roots in simplest $a + bi$ form: $4x^2 - 12x + 25 = 0$

7 Solve for x and express the roots of the equation $8x^2 - 28x + 29 = 0$ in simplest $a + bi$ form.

8 Express the roots of the equation $2x^2 + 4x + 5 = 0$ in simplest $a + bi$ form.

9 Solve the equation $x^2 = 6x - 12$ and express the roots in simplest $a + bi$ form.

10 Express, in simplest $a + bi$ form, the roots of the equation $x^2 + 5 = 4x$.

11 Find the roots of the equation $x^2 + 7 = 2x$ and express your answer in simplest $a + bi$ form.

12 Solve the equation $3x^2 + 5 = 4x$ and express the roots in simplest $a + bi$ form.

13 Solve the equation $x^2 - 4x = -13$ and express the roots in the form $a + bi$.

14 Solve the equation for x and express the roots in simplest $a + bi$ form: $3x^2 = 2x - 1$

- 15 Express the roots of the equation $x^2 = 2x - 5$ in $a + bi$ form.
- 16 Express the roots of the equation $2x^2 = -3(2x + 3)$ in $a + bi$ form.
- 17 Solve the equation $x^2 = 4x - 20$ and express your answers in the form $a + bi$.
- 18 Solve the equation $x(x - 2) + 2 = 0$, and express the roots in the form $a + bi$.
- 19 Solve the equation $x^2 - 4x = -10$ and express the roots in terms of i .
- 20 Express the roots of the equation $x^2 + 1 = 4(x - 1)$ in $a + bi$ form.
- 21 Solve the equation $6x - 34 = x^2$ and express the roots in simplest $a + bi$ form.
- 22 Express the roots of the equation $3x^2 = -2(2x + 3)$ in $a + bi$ form.
- 23 Solve for x and express the roots in terms of i :
 $-3x^2 + 2x = 2$
- 24 Solve for x and express the roots in terms of i :
 $2x^2 = 6x - 5$
- 25 Express the roots of the equation $x^2 + 1 = 8(x - 3)$ in $a + bi$ form.
- 26 Solve for x and express the roots in simplest $a + bi$ form: $x^2 = 6x - 10$
- 27 Solve for x and express your answer in simplest $a + bi$ form: $x^2 - 10x = -41$
- 28 Express the roots of the equation $9x^2 = 2(3x - 1)$ in simplest $a + bi$ form.
- 29 Solve for x and express your answer in simplest $a + bi$ form: $\frac{x^2}{4} = x - 2$
- 30 Express the roots of the equation $-6x = 2x^2 + 5$ in simplest $a + bi$ form.
- 31 Solve for x and express your answer in simplest $a + bi$ form: $x^2 + 29 = 4x$
- 32 In physics class, Taras discovers that the behavior of electrical power, x , in a particular circuit can be represented by the function $f(x) = x^2 + 2x + 7$. If $f(x) = 0$, solve the equation and express your answer in simplest $a + bi$ form.

A2.A.25: Quadratics with Imaginary Solutions: Solve quadratic equations, using the quadratic formula**Answer Section**

1 ANS: 1 REF: 088422siii

2 ANS: 2 REF: 068526siii

3 ANS: 2 REF: 088526siii

4 ANS:

$$-4 \pm 3i. \frac{-8 \pm \sqrt{8^2 - 4(1)(25)}}{2(1)} = \frac{-8 \pm \sqrt{-36}}{2} = \frac{-8 \pm 6i}{2} = -4 \pm 3i$$

REF: 010222b

5 ANS:

$$1 \pm \frac{i\sqrt{3}}{3}$$

REF: 019440siii

6 ANS:

$$\frac{3}{2} \pm 2i$$

REF: 089838siii

7 ANS:

$$\frac{7}{4} \pm \frac{3}{4}i$$

REF: 069937siii

8 ANS:

$$-1 \pm \frac{\sqrt{6}}{2}i$$

REF: 089939siii

9 ANS:

$$3 \pm i\sqrt{3}. \quad x^2 - 6x + 12 = 0. \quad \frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(12)}}{2(1)} = \frac{6 \pm \sqrt{-12}}{2} = \frac{6 \pm 2i\sqrt{3}}{2} = 3 \pm i\sqrt{3}$$

REF: fall9928b

10 ANS:

$$2 \pm i. \quad x^2 - 4x + 5 = 0. \quad \frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(5)}}{2(1)} = \frac{4 \pm \sqrt{-4}}{2} = \frac{4 \pm 2i}{2} = 2 \pm i$$

REF: 080328b

11 ANS:

$$1 \pm i\sqrt{6}. \quad x^2 - 2x + 7 = 0. \quad \frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(7)}}{2(1)} = \frac{2 \pm \sqrt{-24}}{2} = \frac{2 \pm 2i\sqrt{6}}{2} = 1 \pm i\sqrt{6}$$

REF: 010931b

12 ANS:

$$\frac{2}{3} \pm \frac{i\sqrt{11}}{3}. \quad 3x^2 - 4x + 5 = 0. \quad \frac{-(-4) \pm \sqrt{(-4)^2 - 4(3)(5)}}{2(3)} = \frac{4 \pm \sqrt{-44}}{6} = \frac{4 \pm 2i\sqrt{11}}{6} = \frac{2 \pm i\sqrt{11}}{3}$$

REF: 080931b

13 ANS:

$$2 \pm 3i$$

REF: 068038siii

14 ANS:

$$\frac{1}{3} \pm \frac{i\sqrt{2}}{3}$$

REF: 010438siii

15 ANS:

$$1 \pm 2i$$

REF: 088537siii

16 ANS:

$$-\frac{3}{2} \pm \frac{3}{2}i$$

REF: 068636siii

17 ANS:

$$2 \pm 4i$$

REF: 088637siii

18 ANS:

$$1 \pm i$$

REF: 018737siii

19 ANS:

$$2 \pm i\sqrt{6}$$

REF: 088738siii

20 ANS:

$$2 \pm i$$

REF: 018942siii

21 ANS:
 $3 \pm 5i$

REF: 088937siii

22 ANS:
 $-\frac{2}{3} \pm \frac{i\sqrt{14}}{3}$

REF: 089037siii

23 ANS:
 $\frac{1 \pm i\sqrt{5}}{3}$

REF: 019542siii

24 ANS:
 $\frac{3 \pm i}{2}$

REF: 089541siii

25 ANS:
 $4 \pm 3i$

REF: 019638siii

26 ANS:
 $3 \pm i$

REF: 019736siii

27 ANS:
 $5 \pm 4i$

REF: 060042siii

28 ANS:
 $\frac{1}{3} \pm \frac{i}{3}$

REF: 060138siii

29 ANS:
 $2 \pm 2i$

REF: 010242siii

30 ANS:
 $-\frac{3}{2} \pm \frac{1}{2}i$

REF: 080238siii

31 ANS:
 $2 \pm 5i$

REF: 010339siii

32 ANS:

$$-1 \pm i\sqrt{6}. \quad \frac{-2 \pm \sqrt{2^2 - 4(1)(7)}}{2(1)} = \frac{-2 \pm \sqrt{-24}}{2} = \frac{-2 \pm 2i\sqrt{6}}{2} = -1 \pm i\sqrt{6}$$

REF: 010627b