BECA/Huson/Algebra 2: Complex Numbers & Rational Exponents Name: Solutions
7 March 2024

3.18 PreQuiz: Solving quadratics, complex numbers, radicals and exponents

Do Not Use a Calculator A2.REI.4 Solve quadratic equations

1. Solve by factoring.

$$x^2 - 5x + 6 = 0$$

$(x-2)(x-3) = 0$

$x = 2, 3$

2. Solve by completing the square.

$$x^2 + 10x + 20 = 0$$

$\frac{10}{2} = 5$

$5^2 = 25$

$x^2 + 10x + 25 = 5$

$(x+5)^2 = 5$

$x + 5 = \pm\sqrt{5}$

$x = -5 \pm \sqrt{5}$

3. Solve by using the quadratic formula.

$$2x^2 - 5x + 7 = 0$$

$$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(2)(7)}}{2(2)}$$

$$= \frac{5 \pm \sqrt{25 - 56}}{4}$$

$$= \frac{5 \pm \sqrt{31}}{4}$$

$4 \pm \sqrt{7}$

4. Select all of the solutions to $(x-4)^2 = 7$. (HSN.CN.A Complex numbers)

(a) $x = 4 + 7i$

(b) $x = 4 - 7i$

(c) $x = 4 - \sqrt{7}$

(d) $x = 4 - 7 = -3$

(e) $x = 4 + 7 = 11$

(f) $x = 4 + \sqrt{7}$

5. Write each expression in the form $a + bi$ with a, b real numbers.

Given $s = -4 - i$ and $t = 5 + 3i$.

(a) $s + t =$ $(-4+5) + (-1i + 3i)$

$= 1 + 2i$

(b) $s - t =$ $(-4 - i) - (5 + 3i)$

$= -9 - 4i$

(c) $st =$ $(-4 - i)(5 + 3i)$

$= -20 - 12i - 5i - 3i^2$

$= -17 - 17i$

6. Simplify each expression. (HSN.RN.A Rational exponents)

(a) $27^{\frac{2}{3}} =$ 9

(b) $\left(\sqrt{\frac{1}{4}}\right)^{-3} =$ 8

7. Simplify each radical expression.

(a) $\sqrt{81} =$ 9

(b) $\sqrt{18} =$ $\sqrt{9}\sqrt{2}$

$= 3\sqrt{2}$

(c) $\sqrt{-50} =$ $i\sqrt{25}\sqrt{2} = 5i\sqrt{2}$

(d) $\frac{\sqrt{-8}}{\sqrt{2}} =$ $\frac{i\sqrt{4}\sqrt{2}}{\sqrt{2}} = 2i$