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Chapter 4 Algebra 2 Test Part 2 - Practice

Write the expression as a complex number in standard form.

1. $(7-4i)+(3-3i)$

$7-4i+3-3i$

$10-7i$

2. $(6-2i)-(5+i)$

$6-2i-5-i$

$1-3i$

3. $9i(2-3i)$

$18i-27i^2$

$18i-27(-1)$

$18i+27$

$27+18i$

4. $\frac{5}{1+i}\cdot\frac{(1-i)}{(1-i)}$

$\frac{5-5i}{1-i^2}=\frac{5-5i}{1-(-1)}$

$=\frac{5-5i}{2}$

5. Solve the equation by completing the square.
$x^2+16x+39=0$

$x^2+16x=-39$

$x^2+16x+64=-39+64$

$(x+8)^2=25$

$\sqrt{(x+8)^2}=\sqrt{25}$

$x+8=\pm 5$

$x=-8\pm 5$ → -3, -13

6. Write the equation $y=x^2+20x-44$ in the form $y=a(x-h)^2+k$.

$y=(x^2+20x)-44$

$y=(x^2+20x+100)-44-100$

$y=(x+10)^2-144$

Write the quadratic equation in vertex form. Then identify the vertex.

7. $y=5x^2+10x+27$

$y=5(x^2+2x)+27$

$y=5(x^2+2x+1)+27-5$

$y=5(x+1)^2+22$

vertex: $(-1, 22)$

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8. Consider the quadratic function $y = x^2 - 8x + 19$.

a. Write the function in vertex form. Then identify the vertex.

$y = (x^2 - 8x) + 19$

$y = (x^2 - 8x + 16) + 19 - 16$

$y = (x-4)^2 + 3$ vertex: $(4, 3)$

b. Solve $x^2 - 8x + 19 = 0$ by completing the square.

$x^2 - 8x = -19$

$x^2 - 8x + 16 = -19 + 16$

$(x-4)^2 = -3$ $x - 4 = \pm\sqrt{-3}$

$x = 4 \pm i\sqrt{3}$

c. Does the function $y = x^2 - 8x + 19$ have any x-intercepts? *Explain.*

No. Two complex solutions.
(No real solutions)

Solve by any method.

9. $-7x^2 - 2x = 8$

$-7x^2 - 2x - 8 = 0$

$x = \frac{2 \pm \sqrt{4 - 4(-7)(-8)}}{2(-7)} = \frac{2 \pm \sqrt{4 - 224}}{-14}$

$= \frac{2 \pm \sqrt{-220}}{-14} = \frac{2 \pm \sqrt{-1}\cdot\sqrt{4}\cdot\sqrt{55}}{-14}$

$= \frac{2 \pm 2i\sqrt{55}}{-14}$

$= \frac{1 \pm i\sqrt{55}}{-7}$

10. $3x^2 + 5 = -13$

$-5 \quad -5$

$3x^2 = -18$

$x^2 = -6$

$x = \pm\sqrt{-6}$

$x = \pm i\sqrt{6}$

Use the quadratic formula to solve the equation.

11. $x^2 + 6x - 8 = 0$

$x = \frac{-6 \pm \sqrt{6^2 - 4(1)(-8)}}{2(1)} = \frac{-6 \pm \sqrt{36+32}}{2}$

$= \frac{-6 \pm \sqrt{68}}{2} = \frac{-6 \pm \sqrt{4}\sqrt{17}}{2} = \frac{-6 \pm 2\sqrt{17}}{2}$

$= -3 \pm \sqrt{17}$

12. The height in feet (y) of a volleyball that is served can be modeled by the equation $y = -16x^2 + 32x + 6$, where x represents the time in seconds since the ball was served.

a. From what height is the ball served?

6 ft.

b. What is the maximum height reached by the ball?

22 ft.

c. When is the maximum height reached?

after 1 second

d. When does the ball hit the ground?

about 2.17 sec.

e. How long is the ball 18 feet above the ground or higher?

From 0.5 sec to 1.5 sec,
so for 1 second.