Name_____ Name_____

Rally Coach: Take turns solving problems.

Simplify.

1) $(-2 + 7i)^2$

2) $(3 - 6i)^2$

3) $\dfrac{-3 + 6i}{6 + 3i}$

4) $\dfrac{-4 - i}{2 + 2i}$

Solve each equation with the quadratic formula.

5) $x^2 + 9 = 2x$

6) $11n^2 = -2 - 4n$

Write a polynomial function of least degree with integral coefficients that has the given zeros.

7) $-2i, \ 2i, \ 1-i$

8) $3+i, \ 3-i, \ -3i$

State the number of complex zeros and the possible rational zeros for each function. Then find all zeros.

9) $f(x) = x^3 - 3x^2 + x - 3$

10) $f(x) = x^3 + 5x^2 + x + 5$

Answers to Rally Coach: Take turns solving problems.

1) $-45 - 28i$

2) $-27 - 36i$

3) i

4) $\dfrac{-5 + 3i}{4}$

5) $\{1 + 2i\sqrt{2},\ 1 - 2i\sqrt{2}\}$

6) $\left\{\dfrac{-2 + 3i\sqrt{2}}{11},\ \dfrac{-2 - 3i\sqrt{2}}{11}\right\}$

7) $f(x) = x^4 - 2x^3 + 6x^2 - 8x + 8$

8) $f(x) = x^4 - 6x^3 + 19x^2 - 54x + 90$

9) # of complex zeros: 3
   Possible rational zeros: $\pm\, 1, \pm\, 3$
   Zeros: $\{3,\ i,\ -i\}$

10) # of complex zeros: 3
    Possible rational zeros: $\pm\, 1, \pm\, 5$
    Zeros: $\{-5,\ i,\ -i\}$