Standard 2 Review:

Name: _____

1. **Find the following powers of *i*.**

   a. i^2

   b. i^{25}

   c. i^{126}

   d. i^{47}

2. **Write the following as complex numbers in standard form.**

   a. $\sqrt{-100}$

   b. $2+\sqrt{-36}$

   c. $-3-\sqrt{-28}$

   d. $\sqrt{-3}\bullet\sqrt{-12}$

3. **Simplify and write the following as complex numbers in standard form.**

   a. $(4+2i)+(7-5i)$

   b. $(6-3i)-(4-9i)$

   c. $2(3-9i)$

   d. $5i(6+3i)$

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

   f. $(1-5i)(3+4i)$

4. **Simplify the following complex numbers.**

   a. $\dfrac{4+10i}{2-7i}$

   b. $\dfrac{3+6i}{2+3i}$

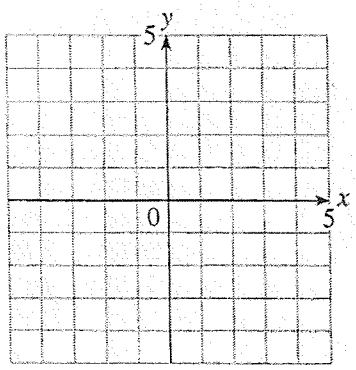
5. **Graph the following numbers on the complex plane.**

   a. $2+3i$

   b. $-1-2i$

   c. -5

   d. $4i$



6. Find all the factors and all the roots of each polynomial

a. $f(x) = x^2 + 4x + 8$

b. $f(x) = x^2 - 2x + 10$

c. $f(x) = 3x^3 + 27x$

d. $f(x) = x^4 - 1296$

e. $f(x) = x^4 + 41x^2 + 400$

f. $f(x) = x^3 + 3x^2 + 16x + 48$

g. $f(x) = x^3 - 2x^2 + 36x - 72$
(hint: $6i$ is a root)

h. $f(x) = x^3 - 3x^2 - 15x + 125$
(hint: $4 - 3i$ is a root)

7. Find a polynomial with the following zeros

a. $-2, 5i$

b. $4, -4, 4i,$

c. $0, 0, -3i, 6i$

d. $3, 7 + 2i$