Math 12 – Workshop #20

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1. Write the imaginary number in simplified form

   (a) $\sqrt{-16}$ (b) $\sqrt{-10}$

2. Divide and write the expression in standard form. Assume a and b are real numbers which are not both zero.

   (a) $\dfrac{7}{2-i}$ (c) $\dfrac{2+9i}{2-9i}$

   (b) $\dfrac{1}{3+4i}$ (d) $\dfrac{1}{a+bi}$

3. Let $\omega = -\dfrac{1}{2} + \dfrac{\sqrt{3}}{2}i$. Compute the following

ω	$=$	$-\frac{1}{2} + \frac{\sqrt{3}}{2}i$	ω^4	$=$	ω^7	$=$
ω^2	$=$		ω^5	$=$	ω^8	$=$
ω^3	$=$		ω^6	$=$	ω^9	$=$

   Use the pattern to find ω^{33}, ω^{97} and ω^{1246}

4. Use the square root property to solve

   (a) $x^2 = 9$ (c) $(x+3)^2 = 4$

   (b) $(x-2)^2 = 9$ (d) $(x-1)^2 - 3 = 0$

5. Fill in the blank to make the following equations true

   (a) $x^2 + 6x + \_\_\_\_\_ = (x+3)^2$ (b) $x^2 + 3x + \_\_\_\_\_ = \left(x + \dfrac{3}{2}\right)^2$

6. What number could you add to both sides of the following equations to make the left hand side a perfect square?

   (a) $x^2 + 6x = 1$ (b) $x^2 + 3x = 2$ (c) $x^2 + 5x = 1$

7. Complete the square to solve.

   (a) $x^2 + 2x = 4$ (c) $\dfrac{5x-1}{-3} = x^2$

   (b) $x^2 + 4x = 5$ (d) $x^2 - 14x + 50 = 0$

8. Suppose that m is a real number. For each of the following solve for x by completing the square

   (a) $x^2 + 4x + m = 0$ (b) $x^2 + mx + 1 = 0$