6.1 Factoring + Square root methods.

3 cases to consider when solving $ax^2 + bx + c = 0$:

1. When a, b, c are $\mathbb{R}$, factor by guess + check.

2. When $c = 0$, a, b are $\mathbb{R}$, factor by GCF

3. When $b = 0$, a, c are $\mathbb{R}$, solve by square root method

will have imaginary numbers.

$$2. \ 5x^2 = 5x$$
$$\underline{-5x \quad -5x}$$
$$25x^2 - 5x = 0$$
$$\underline{5x}(\underline{5x - 1}) = 0$$

zero product property

$$\frac{5x}{5} = \frac{0}{5} \quad or \quad 5x - 1 = 0$$
$$\underline{+1 \quad +1}$$
$$x = 0 \qquad \frac{5x}{5} = \frac{1}{5}$$
$$or \qquad x = \frac{1}{5}$$

$$3x^2 + 11x = 4$$
$$ \underline{-4 \qquad -4}$$

$$3x^2 + 11x - 4 = 0$$

$$(3x - 1)(x + 4) = 0 \qquad \begin{array}{l} 1,4 \\ 2,2 \\ 4,1 \end{array}$$

$$\begin{array}{r} -1x \\ +12x \\ \hline 11x \end{array}$$

$$3x - 1 = 0 \quad \text{or} \quad x + 4 = 0$$
$$\underline{+1 \; +1} \qquad\qquad \underline{-4 \; -4}$$
$$\frac{3x}{3} = \frac{1}{3} \qquad\qquad x = -4$$

$$x = \frac{1}{3} \quad \text{or}$$

$$2x^2 + 8 = 0$$
$$\underline{\quad -8 \quad -8}$$
$$\frac{2x^2}{2} = \frac{-8}{2}$$
$$\sqrt{x^2} = \sqrt{-4}$$
$$\boxed{x = \pm 2i}$$

$\rightarrow$ whenever you apply a root, your answer needs a $\pm$.

HW: p. 372

2-72 every other even,
every even E.C.