

1) Solve $x^2 - 6x - 16 = 0$ by completing the square.

$$\begin{aligned}x^2 - 6x &= 16 & \left(-\frac{6}{2}\right)^2 &= (-3)^2 = 9 \\x^2 - 6x + 9 &= 16 + 9 \\(x - 3)^2 &= 25 \\x - 3 &= \pm 5 \\x - 3 = 5 & & x - 3 = -5 \\x = 2 & & x = -8\end{aligned}$$

Answer: $x = 2$ or $x = -8$

2) Write the function $f(x) = x^2 - 14x - 13$ in vertex form, and identify its vertex.

$$\begin{aligned}13 &= x^2 - 14x & \left(-\frac{14}{2}\right)^2 &= (-7)^2 = 49 \\13 + 49 &= x^2 - 14x + 49 \\62 &= (x - 7)^2 \\f(x) &= (x - 7)^2 - 62\end{aligned}$$

Vertex Form: $f(x) = (x - 7)^2 - 62$
Vertex: $(7, -62)$

Solve each equation.

3) $2x^2 + 72 = 0$

$$\frac{2x^2}{2} = \frac{-72}{2}$$

$$x^2 = -36$$

$$x = \pm 6i$$

Answer: $x = \pm 6i$

4) $x^2 + 12x + 45 = 0$

$$x^2 + 12x = -45$$

$$x^2 + 12x + 36 = -45 + 36 \quad \left(\frac{12}{2}\right)^2 = 36$$

$$(x + 6)^2 = -9$$

$$x + 6 = \pm 3i$$

Answer: $x = -6 \pm 3i$

Perform each indicated operation, and write the result in the form $a + bi$.

5) $|5 + 12i|$

$$= \sqrt{25 + 144}$$

$$= \sqrt{169}$$

Answer: 13

6) $(-1 - 8i) + (4 + 3i)$

Answer: $3 - 5i$

$$\frac{2}{4} \cdot \frac{1}{2} = \frac{2}{8}$$

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

Answer: $-6 - 4i$

8) Solve using any method: $g(x) = 4x^2 - 3x + 1$

$$\begin{aligned} -1 &= \frac{4x^2}{4} - \frac{3x}{4} & \left(\frac{3}{8}\right)^2 \\ \frac{9}{64} + -\frac{1}{4} &= x^2 - \frac{3}{4}x + \frac{9}{64} & = \frac{9}{64} \\ \frac{9}{64} + -\frac{16}{64} &= (x - \frac{3}{8})^2 \\ \sqrt{-\frac{7}{64}} &= \sqrt{(x - \frac{3}{8})^2} \end{aligned}$$

Answer: _____

$$\pm \frac{\sqrt{-7}}{8} = x - \frac{3}{8}$$

$$\pm \frac{i\sqrt{7}}{8} = x - \frac{3}{8}$$

$$\boxed{x = \frac{3}{8} \pm \frac{i\sqrt{7}}{8}} \quad \text{☺}$$

↓
If you got this,
then you will be
able to do the
E.C. tomorrow!