

For # 1-6, perform the indicated operation and write the result in standard form.

1.  $(4+i)(7-2i)$   
 $(4+i)(7-2i)$   
 $-3+3i$

2.  $13i(14-7i)$   
 $13i(14-7i)$   
 $-14+20i$

3.  $(\frac{3}{2} + \frac{5}{2}i) + (\frac{5}{3} + \frac{11}{3}i)$   
 $(\frac{3}{2} + \frac{5}{2}i) + (\frac{5}{3} + \frac{11}{3}i)$   
 $\frac{9+15i}{6} + \frac{10+22i}{6}$   
 $= \frac{19+37i}{6}$

4.  $(1+i)(3-2i)$   
 $(1+i)(3-2i)$   
 $3-2i+3i-2i^2$   
 $5+i$

5.  $(\sqrt{3} + \sqrt{15}i)(\sqrt{3} - \sqrt{15}i)$   
 $(\sqrt{3} + \sqrt{15}i)(\sqrt{3} - \sqrt{15}i)$   
 $3 - \sqrt{45}i + \sqrt{45}i - 15i^2$   
 $18$

6.  $(5-4i)^2$   
 $(5-4i)(5-4i)$   
 $25 - 20i - 20i + 16i^2$   
 $9-40i$

For #7-8, write the quotient in standard form.

7.  $\frac{2(4+5i)}{4-5i}$   
 $\frac{2(4+5i)}{4-5i}$   
 $\frac{8+10i}{16-25i^2(-1)}$   
 $\frac{8+10i}{41}$

8.  $\frac{2+i}{2-i} \cdot \frac{2+i}{2+i}$   
 $\frac{2+i}{2-i} \cdot \frac{2+i}{2+i}$   
 $\frac{4+2i+2i+i^2}{4-i^2(-1)}$   
 $\frac{3+4i}{5}$

For #9-12, solve the quadratic equation.

9.  $x^2 + 25 = 0$

$$\sqrt{x^2 = -25}$$

$$x = \pm 5i$$

Not factorable

11.  $16x^2 - 4x + 3 = 0$

$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(16)(3)}}{2(16)}$$

$$x = \frac{4 \pm \sqrt{-176}}{32} \leftarrow \frac{\sqrt{-176}}{\sqrt{11}} \cdot \frac{i}{4}$$

$$x = \frac{4 \pm 4i\sqrt{11}}{32}$$

$$x = \frac{1 \pm i\sqrt{11}}{8}$$

Not factorable

10.  $x^2 + 6x + 10 = 0$

$$x = \frac{-6 \pm \sqrt{6^2 - 4(1)(10)}}{2(1)}$$

$$x = \frac{-6 \pm \sqrt{-4}}{2} \leftarrow \frac{\sqrt{-4}i}{\sqrt{4}2}$$

$$x = \frac{-6 \pm 2i}{2} \rightarrow x = -3 \pm i$$

12.  $4x^2 + 16x + 15 = 0$

Factorable

	2x	3	
2x	4x <sup>2</sup>	6x	- 60
5	10x	15	+ 16
			10 6

$$(2x+5)(2x+3) = 0$$

$$x = \frac{-5}{2}, \frac{-3}{2}$$