

## Imaginary and Complex Numbers

Simplify each of the following:

1.  $\sqrt{-7}$

2.  $\sqrt{-225}$

3.  $\sqrt{-16}$

4.  $\sqrt{-72}$

5.  $\sqrt{-98}$

6.  $\sqrt{-9} + \sqrt{-16}$

7.  $\sqrt{-2} + 3\sqrt{-2}$

8.  $\sqrt{-5} - 2\sqrt{-5}$

9.  $\sqrt{-25} - \sqrt{-49}$

10.  $\sqrt{-8} + \sqrt{-18}$

11.  $2\sqrt{-3} - \sqrt{-27}$

12.  $\sqrt{-2}\sqrt{-8}$

13.  $\sqrt{-2}\sqrt{-5}$

14.  $\sqrt{-3}\sqrt{-6}$

15.  $\sqrt{-9}\sqrt{-4}$

16.  $2\sqrt{-5} \times 3\sqrt{-5}$

17.  $\sqrt{-6} \times 2\sqrt{12}$

18.  $\sqrt{11} \times \sqrt{-11}$

19.  $\sqrt{-12} \times \sqrt{-3}$

20.  $\frac{\sqrt{25}}{\sqrt{-49}}$

21.  $\frac{\sqrt{-36}}{\sqrt{-16}}$

22.  $\frac{\sqrt{-144}}{\sqrt{162}}$

23.  $\frac{\sqrt{54}}{\sqrt{-96}}$

24.  $\frac{\sqrt{-72}}{\sqrt{98}}$

25.  $\sqrt{-45} + \sqrt{-20} - \sqrt{-180}$

26.  $\sqrt{-147} - \sqrt{-27} - \sqrt{-192} + \sqrt{-75}$

27.  $2\sqrt{-3} + 2\sqrt{12}$

28.  $5\sqrt{-24} - 8\sqrt{-6}$

29.  $\sqrt{-2}(3 - \sqrt{-2})$

30.  $(\sqrt{-3} + 2)(\sqrt{-3} + 5)$

Determine the quadratic equation for each pair of roots:

1.  $6 + i, 6 - i$

2.  $4 - 5i, 4 + 5i$

3.  $7 - i\sqrt{2}, 7 + i\sqrt{2}$

4.  $5 + 2i\sqrt{3}, 5 - 2i\sqrt{3}$