MAC1105 College Algebra
1.4 Practice Problems

Solve the quadratic equation by factoring.

1. $x^2+3x-40=0$

$(x+8)(x-5)=0$

$x+8=0$ $\quad x-5=0$

$-8\ -8$ $\quad +5\ +5$

$x=-8$ $\quad x=5$

2. $10x^2+7x-12=0$

$(5x-4)(2x+3)=0$

$5x-4=0$ $\quad 2x+3=0$

$+4\ +4$ $\quad -3\ -3$

$\frac{5x}{5}=\frac{4}{5}$ $\quad \frac{2x}{2}=\frac{-3}{2}$

$x=4/5$ $\quad x=-3/2$

3. $x^2-16=0$

$(x+4)(x-4)=0$

$x+4=0$ $\quad x-4=0$

$-4\ -4$ $\quad +4\ +4$

$x=-4$ $\quad x=4$

Solve the quadratic equation using the square root method.

4. $\frac{9x^2}{9}=\frac{25}{9}$

$x^2=\frac{25}{9}$

$\sqrt{x^2}=\sqrt{\frac{25}{9}}$

$x=\pm\frac{5}{3}$

5. $(x-2)^2-9=0$

$+9\ +9$

$(x-2)^2=9$

$\sqrt{(x-2)^2}=\sqrt{9}$

$x-2=\pm 9$

$+2\ +2$

$x=2\pm 9$ $\quad 2+9=11$, $\ 2-9=-7$

Solve the quadratic equation by completing the square.

6. $x^2+4x+6=0$

$x^2+4x = -6$

$x^2+4x+4 = -6+4$

$(x+2)(x+2) = -2$

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

$\sqrt{(x+2)^2} = \sqrt{-2}$

$x+2 = \pm i\sqrt{2}$

$-2 \quad -2$

$x = -2 \pm i\sqrt{2}$

7. $x^2-6x-7=0$

$x^2-6x = 7$

$x^2-6x+9 = 7+9$

$(x-3)(x-3) = 16$

$(x-3)^2 = 16$

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

$x-3 = \pm 4$

$+3 \quad +3$

$x = 3 \pm 4$

$3+4 = 7$

$3-4 = -1$

8. $2x^2-4x-5=0$

$\frac{2x^2}{2} - \frac{4x}{2} = \frac{5}{2}$

$x^2-2x = \frac{5}{2}$

$x^2-2x+1 = \frac{5}{2}+1$

$(x-1)^2 = \frac{7}{2}$

$\sqrt{(x-1)^2} = \sqrt{\frac{7}{2}}$

$x-1 = \pm\sqrt{\frac{7}{2}}$

$+1 \quad +1$

$x = 1 \pm \sqrt{\frac{7}{2}}$

Solve the quadratic equation using the quadratic formula.

9. $3x^2-4x-9=0$

$a=3 \quad b=-4 \quad c=-9$

$x = \frac{-(-4) \pm \sqrt{(-4)^2-4(3)(-9)}}{2(3)}$

$= \frac{4 \pm \sqrt{16+108}}{6}$

$= \frac{4 \pm \sqrt{124}}{6}$

$= \frac{4 \pm \sqrt{4 \cdot 31}}{6}$

$= \frac{4 \pm 2\sqrt{31}}{6} = \frac{2 \pm \sqrt{31}}{3}$

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

$a=2 \quad b=1 \quad c=6$

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

$= \frac{-1 \pm \sqrt{1-48}}{2}$

$= \frac{-1 \pm \sqrt{-47}}{2}$

$= \frac{-1 \pm i\sqrt{47}}{2}$