Access to Science, Engineering and Agriculture: Mathematics 1
MATH00030
Chapter 3 Exercises

1. Write the following expressions in completed square form.

   (a) $x^2 + 4x - 5$.

   (b) $x^2 - 8x - 20$.

   (c) $x^2 + 5x - 6$.

   (d) $x^2 - 7x + 2$.

   (e) $2x^2 + 3x$.

   (f) $-3x^2 + 5x - 1$.

   (g) $\frac{1}{3}x^2 - \frac{1}{4}x - \frac{2}{3}$.

   (h) $-\frac{3}{4}x^2 + 2x - \frac{1}{5}$.

2. Solve the following equations by using the completed square forms you found in Question 1.

   (a) $x^2 + 4x - 5 = 0$.

   (b) $x^2 - 8x - 20 = 0$.

   (c) $x^2 + 5x - 6 = 0$.

   (d) $x^2 - 7x + 2 = 0$.

   (e) $2x^2 + 3x = 0$.

   (f) $-3x^2 + 5x - 1 = 0$.

   (g) $\frac{1}{3}x^2 - \frac{1}{4}x - \frac{2}{3} = 0$.

   (h) $-\frac{3}{4}x^2 + 2x - \frac{1}{5} = 0$.

3. Solve the following equations by using the quadratic formula.

   (a) $x^2 + x - 1 = 0$.

   (b) $x^2 - x + 1 = 0$.

   (c) $-4x^2 - x + 3 = 0$.

   (d) $x^2 + 1 = 0$.

   (e) $-3x^2 + 4x = 0$.

   (f) $\frac{1}{5}x^2 - \frac{1}{4}x + \frac{1}{3} = 0$.

(g) $x^2 + 4x + 4 = 0$.

4. Sketch the graphs of the following functions. You may use the information you found in Question 3.

   (a) $y = x^2 + x - 1$.
   (b) $y = x^2 - x + 1$.
   (c) $y = -4x^2 - x + 3$.
   (d) $y = x^2 + 1$.
   (e) $y = -3x^2 + 4x$.
   (f) $y = \frac{1}{5}x^2 - \frac{1}{4}x + \frac{1}{3}$.
   (g) $y = x^2 + 4x + 4$.

5. Factorize the following expressions (if possible). You may use the information you found in Question 3.

   (a) $x^2 + x - 1$.
   (b) $x^2 - x + 1$.
   (c) $-4x^2 - x + 3$.
   (d) $x^2 + 1$.
   (e) $-3x^2 + 4x$.
   (f) $\frac{1}{5}x^2 - \frac{1}{4}x + \frac{1}{3}$.
   (g) $x^2 + 4x + 4$.

6. Factorize the following expressions by inspection.

   (a) $x^2 + 5x + 4$.
   (b) $x^2 - 5x + 6$.
   (c) $x^2 - 4x$.
   (d) $x^2 - 4$.
   (e) $x^2 + x - 12$.