

1.1 Factor the following completely:

1. $2x^2 - 5x$
 $2x^2 - 5x = x(2x - 5)$

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

3. $2x^2 - 11x + 14$
 $(2x-7)(x-2)$
 $2x^2 - 11x + 14 = (2x-7)(x-2)$

1.2 Factor each polynomial equation by factoring:

1. $x^2 + 2x - 15 = 0$
 $(x+5)(x-3) = 0$
 $x+5 = 0$ or $x-3 = 0$
 $x = -5$ or $x = 3$

2. $x^2 - 10x + 25 = 0$
 $(x-5)(x-5) = 0$
 $x-5 = 0$
 $x = 5$

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

4. $x^2 - 9 = 0$
 $(x+3)(x-3) = 0$
 $x+3 = 0$ or $x-3 = 0$
 $x = -3$ or $x = 3$

1.3 Identify the domain of each function and state the restrictions:

1. $f(x) = \frac{1}{x-3}$
 Domain: $x \neq 3$
 Restriction: $x \neq 3$

2. $g(x) = \frac{1}{x^2-4}$
 Domain: $x \neq 2, -2$
 Restriction: $x \neq 2, -2$

3. $h(x) = \frac{1}{x^2+1}$
 Domain: $x \in \mathbb{R}$
 Restriction: None

4. $k(x) = \frac{1}{x^2-1}$
 Domain: $x \neq 1, -1$
 Restriction: $x \neq 1, -1$