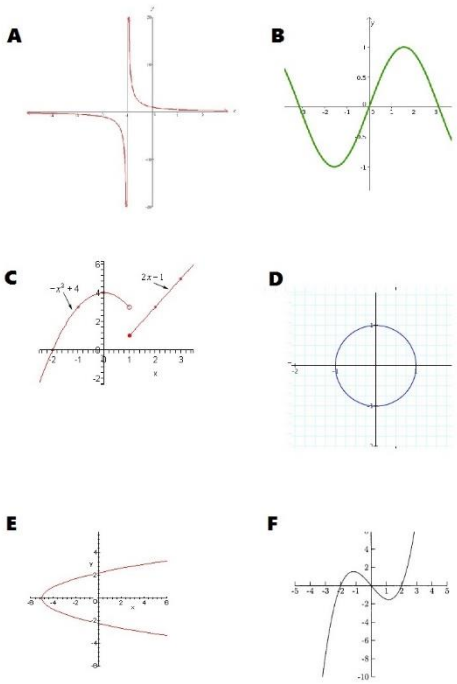
1. Given h(x) = x^3, f(x) = $2x^2$ - 5, d(x) = $2x$ and g(x) = $-3x^2 + 2x + 1$
   a. Sketch the graph of each function
   b. State the range of each function
   c. Describe if the function is one-to-one, many-to-one, one-to-many, or many-to-many
   d. Find $f^{-1}(x)$ and $g^{-1}(x)$

2. Given the function $p(x) = 2x - 3$ find
   a. p(5)
   b. a when p(a) = 15
   c. the range and domain of *p(x)*
   d. $p^{-1}(x)$

3. If the function $h(x) = x^2 - 2x - 1$ and $g(x) = \frac{1}{2x+1}$, find
   a. h(2) and g(-2)
   b. a when *g(a)* = 15
   c. the range of *h(x)*
   d. the domain of *g(x)*
   e. $h^{-1}(x)$
   f. *gh(x)*

4. (a) State which of the following graphs represent functions, and (b) describe the relationship between range and domain for each.



5. Given the functions $f(x) = 3x + 1$ and $g(x) = 3x^2$, find
   a. fg(x)
   b. ff(x)
   c. fg(3)
   d. gf(3)

6. Given the functions $g(x) = 4x^2 - 1$ and $h(x) = 2^x$, find
   a. *gh(x)*
   b. *hg(x)*
   c. the range and domain of each of the composite functions in a and b
   d. $g^{-1}(x)$ and $h^{-1}(x)$

7. The function *f(x)* is defined by $f(x) = 3x - 2$ where $\{x \in R, x \geq -2\}$. Find the function $f^{-1}(x)$ stating both its range and domain.

8. The function *g(x)* is defined by $g(x) = x^2 - 4x - 3$.
   a. State the domain and range of *g(x)*
   b. Find $g^{-1}(x)$
   c. State the domain and range of $g^{-1}(x)$
   d. By sketching *g(x)* and $g^{-1}(x)$, find the values of *x* such that $g(x) = g^{-1}(x)$

9. The functions s and t are defined by
   $s: x \rightarrow \frac{x}{x-2}$ $\{x \in R,\ x \neq 2\}$
   $t: x \rightarrow \frac{5}{x}$ $\{x \in R,\ x \neq 0\}$
   a. Find an expression for $s^{-1}(x)$
   b. Write down the range of $s^{-1}(x)$
   c. Calculate $ts(1.2)$
   d. Use algebra to find the exact values of x for which $t(x) = s(x) + 3$