Linear Functions

1 Graphing Linear Functions

1. Graph the following fucntions in the given domain:
   (a) $f(x) = x + 2$ Domain: $-5 \leq x \leq 1$
   (b) $f(x) = x - 1$ Domain: $-3 \leq x \leq 3$
   (c) $f(x) = 2x + 4$ Domain: $-4 \leq x \leq 2$
   (d) $f(x) = 3x - 2$ Domain: $-2 \leq x \leq 4$
   (e) $f(x) = 4x - 3$ Domain: $-1 \leq x \leq 5$
   (f) $f(x) = -3x + 4$ Domain: $-3 \leq x \leq 4$
   (g) $f(x) = 5 - 2x$ Domain: $-2 \leq x \leq 5$
   (h) $f(x) = -4x$ Domain: $-3 \leq x \leq 3$

2 Linear Functions

1. A function $f(x)$ is defined as $f(x) = x + 2$. Find:
   (a) $f(1)$
   (b) $f(3)$
   (c) $f(-1)$
   (d) $f(-2)$
2. A fucntion $f : x$ is defined as $f : x \to 2x + 3$. Find:
   (a) $f(2)$
   (b) $f(5)$
   (c) $f(-2)$
   (d) $f(0)$
3. If $f(x) = 5 - 3x$, find:
   (a) $f(3)$
   (b) $f(-4)$
   (c) $f(0)$
   (d) $f(\frac{1}{3})$

(e) Find $f(k)$ in terms of k

4. If $f(x) = 3x - 2$, find:
   (a) $f(3)$
   (b) $f(4) + f(2)$
   (c) $4 + f(2)$
   (d) $f(\frac{1}{2})$
   (e) $f(3) - f(1)$
   (f) $3 - f(1)$

5. If $f(x) = 5 - 4x$, find:
   (a) $f(0)$
   (b) $f(\frac{1}{2})$
   (c) $f(\frac{3}{4})$
   Find in terms of k;
   (d) $f(k)$
   (e) $f(3k)$
   (f) $3f(k)$
   (g) $f(k + 1)$
   (h) $f(k) + 1$

6. If $f(x) = 2x + 4$, find:
   (a) $f(3) + f(5)$
   (b) $f(3) + 5$
   (c) $3f(5)$
   (d) $5f(3)$
   Find in terms of k
   (e) $f(k)$
   (f) $f(3k)$
   (g) $f(k + 3)$
   (h) $f(k) + 3$

7. If $f(x) = 2 - 3x$, find:
   (a) $f(\frac{2}{3})$
   (b) $f(-\frac{1}{3})$?
   (c) $2f(3)$
   (d) $\frac{1}{2}f(4)$
   (e) $3f(2) - 2f(3)$
   Find in terms of k;

(f) $3f(k)$

(g) $f(3k) + 3$

(h) $3f(k + 3)$

8. If $f(x) = 5x + 1$, find:
   (a) $f(\frac{2}{5})$
   (b) $2f(\frac{1}{5})$
   (c) $f(x - 2)$
   (d) $f(x) - 2$
   (e) $-2f(x)$
   (f) $f(x - 2) - f(-2)$
   (g) $-2f(x - 2) - 2$

9. If $f(x) = 3 - 4x$, Solve for x:
   (a) $f(x) = -5$
   (b) $f(x) = x$
   (c) $f(x) = f(-1)$
   (d) $f(x) = 15$
   (e) $f(x) + f(2x) = 0$

10. If $f(x) = 3x + 2$, Solve for k:
    (a) $f(k) = 11$
    (b) $f(k + 1) = -4$
    (c) $f(k + 1) = f(2)$
    (d) $f(k + 1) + f(k) + 1 = 0$

11. If $f(x) = 1 - 2x$, Solve for x:
    (a) $f(x) = -1$
    (b) $f(x) = -x$

    Find the value of k for which:

    (c) $f(k) = f(3)$
    (d) $f(k - 1) = f(4)$

12. $f(x) = 3x$, and $g(x) = x + 4$
    Find:
    (a) $f(3)$
    (b) $g(2)$

    Find the value of x for which:

    (c) $f(x) = g(x)$
    (d) $g(x + 1) = f(3)$

    Find the value of k for which:

(e) $f(5) = kg(1)$

(f) $g(5) = kf(-1)$

13. $f(x) = 2 - 3x$ and $g(x) = 2x + 7$
Find:

(a) $f(\frac{2}{3})$

(b) $g(\frac{1}{2})$

Find the value of x for which:

(c) $f(x) = g(x)$

(d) $g(x) = f(1)$

(e) $f(x) = g(-2)$

(f) $f(x + 1) = g(5)$

14. $f(x) = 2 - 3x$, and $g(x) = 2x + 7$
Find the value of k for which:

(a) $f(4) = kg(-1)$

(b) $g(4) = kf(-\frac{1}{3})$