Manipulation of Formulae

1. If $2a - b = c$, express a in terms of b and c.

2. If $3p + q = r$, express p in terms of q and r.

3. If $ab - c = d$, express b in terms of a, c and d.

4. If $u + at = v$, express t in terms of a, u and v.

5. If $3p + 2q = 5r$, express p in terms of q and r.

6. If $3a - 4b = 2c$, express b in terms of a and c.

7. If $2(p - r) = q$, express p in terms of q and r.

8. If $y(x - a) = t$, express x in terms of a, t and y.

9. If $\frac{a+b}{2} = c$, express a in terms of b and c.

10. If $p = \frac{q-2r}{3}$, express r in terms of p and q.

11. If $x = \frac{1}{2}(y - z)$, express z in terms of x and y.

12. If $a = \frac{b}{3} - c$, express c in terms of a and b.

13. If $\frac{p}{3} + \frac{q}{2} = r$, express p in terms of q and r.

14. If $\frac{ap}{4} + \frac{bp}{2} = c$, express p in terms of a, b and c.

15. If $r = \frac{1}{s} + t$, express s in terms of r and t.

16. If $p + \frac{t}{q} = r$, express q in terms of p, t and r.

17. If $\frac{a}{b} = \frac{b}{c} + d$, express c in terms of a, b and d.

18. If $\frac{1}{b} = \frac{3}{p} - \frac{4}{a}$, express p in terms of a and b.

19. If $\frac{1}{u} + \frac{1}{v} = \frac{1}{f}$, express f in terms of u and v.

20. If $p = \frac{q}{r-s}$, express s in terms of p, q and r.

21. If $c = \frac{2ab}{a+b}$, express b in terms of a and c.
    Hence, or otherwise, find the value of b when $a = 4$ and $c = 6$.

22. (a) If $x = \frac{p+q}{p-q}$, express p in terms of q and x.

(b) If $\frac{p}{p-x} = \frac{q}{q+x}$, express p in terms of q.

23. If $r = \frac{q^2 - pr}{q+p}$, express p in terms of q and r.

24. If $p^2 q = r$, express p in terms of q and r.

25. If $\frac{1}{2}at^2 = s$, express t in terms of a and s.

26. If $c = \frac{b}{a^2}$, express a in terms of b and c.

27. If $m^2 = \frac{1}{h^2} - 8p$, express h in terms of p and m.
    Hence, determine the values of h when $m = 9$ and $p = -7$.

28. If $\sqrt{x} = y$, express x in terms of y.

29. If $\sqrt{pq} = r$, express p in terms of q and r.

30. If $a = \sqrt{\frac{p}{q}}$, express q in terms of a and p.

31. If $3\sqrt{xy} = z$, express y in terms of x and z.

32. If $\frac{1}{2}\sqrt{ut} = s$, express u in terms of t and s.

33. If $\sqrt{2x - 3} = y$, express x in terms of y.

34. If $\sqrt{pq - r} = s$, express p in terms of q, r and s.

35. If $t = k\sqrt{\frac{l}{g}}$, express l in terms of t, k and g.

36. If $t = \sqrt{\frac{x}{y-2}}$, express y in terms of t and x.
    hence determine the value of y if $x = 25$ and $t = 5$.

37. If $\frac{p}{2} = \sqrt{\frac{1}{x^2-4}}$, express x^2 in terms of p.
    If $p = 2$ and $x = \sqrt{k}$, determine the value of k.

38. $y = ax - 2a^2, x = 2 + 3a$
    (a) express y in terms of a
    (b) evaluate y when $a = -2$

39. $y = ax + a^3, x = 3 - 2a^2$
    (a) express y in terms of a
    (b) evaluate y when $a = 1$

40. $z + 3 = 2x, y = 2z - 3(x - 2)$
    (a) express z in terms of x
    (b) express y in terms of x

41. If $\frac{1}{3}(a - 2b) = \frac{1}{4}$, express a in terms of b.
    If $z + 3a = 2b$ and $w - 2a = 4b$, show that $2z + w = -3$

42. (a) If $q^2x = p + 2q^2$, express x in terms of p and q.

   (b) If $y = q(x - 4)$, show that $y = \frac{p - 2q^2}{q}$

   Hence, evaluate y when $p = 30$ and $q = 3$.

43. If $px - b = a - qx$, express x in terms of a, b, p and q.

   If $\sqrt{2p} = 4a$ and $q = -8b^2$, show that $8x = \frac{1}{a - b}$