Changing the Subject of a Formula

Exercise 1
Make \( x \) the subject of these formulas.

1) \( x + 4 = y \)  
2) \( x + a = 7 \)  
3) \( x + 3 = b \)

4) \( x + a = b \)  
5) \( x - b = 8 \)  
6) \( x - a = 5 \)

7) \( x - 4 = c \)  
8) \( x - p = q \)  
9) \( 2x = f \)

10) \( 3x = a \)  
11) \( ax = 4 \)  
12) \( cx = d \)

13) \( px = -q \)  
14) \( dx = -f \)  
15) \( kx + h = 0 \)

16) \( 2x + 3 = c \)  
17) \( 3x + y = 4 \)  
18) \( ax + b = 9 \)

19) \( 2x + 4 = b \)  
20) \( 4x + r = h \)  
21) \( 3x - k = 5 \)

22) \( 3x - c = a \)  
23) \( 2x - c = d \)  
24) \( ax - 3 = m \)

25) \( ax - b = 7 \)  
26) \( px - q = r \)

Exercise 2
Make \( x \) the subject of these formulas.

1) \( \frac{x}{a} = 3 \)  
2) \( \frac{x}{5} = a \)  
3) \( \frac{x}{c} = 4 \)

4) \( \frac{x}{a} = b \)  
5) \( \frac{x}{5} = 5 \)  
6) \( \frac{x}{p} = q \)
7) \( \frac{x}{3} = y \)

8) \( \frac{3x}{4} = h \)

9) \( \frac{ax}{5} = b \)

10) \( \frac{cx}{p} = q \)

11) \( \frac{x}{a} = bc \)

12) \( k = \frac{x}{r} \)

Change the subject of each of the following formulas to the variable indicated.

13) \( C = \pi d \) to \( d \)

14) \( S = \pi dn \) to \( n \)

15) \( PV = c \) to \( V \)

16) \( A = \pi rl \) to \( l \)

17) \( v = 2gh \) to \( h \)

18) \( I = PRT \) to \( R \)

19) \( x = \frac{a}{y} \) to \( a \)

20) \( I = \frac{E}{R} \) to \( E \)

21) \( x = \frac{u}{a} \) to \( u \)

22) \( P = \frac{RT}{V} \) to \( T \)

23) \( v = u + at \) to \( t \)

24) \( n = p + cr \) to \( r \)

25) \( y = ax + b \) to \( x \)

26) \( H = S + qL \) to \( q \)

27) The perimeter of a square is \( P = 4x \). Change the subject to \( x \).

28) The area of a rectangle is \( A = lb \). Change the subject to \( l \).

29) The volume of a cuboid is \( V = lbh \). Change the subject to \( h \).

30) The speed of a train is \( S = \frac{D}{T} \). Change the subject to \( D \).

31) The current in a circuit is \( I = \frac{V}{R} \). Change the subject to \( V \).

32) The equation of a straight line is \( y = mx + c \). Change the subject to \( m \).