Linear equations in one unknown

Linear equation is an equation of a straight line. It is an equation whose unknown variable has the highest power one. E.g. y = x + 5, 4y = 3x + 4, etc.

Linear equation in one unknown is the one which has got only one unknown variable, such as x + 2 = 5, $\frac{2x-3}{x+2} = 4$, …..

Solving for unknown of the equation is the same as making that variable the subject of the equation

Example 1

Solve the following equations

(i)   4x + 4 = 10

Solution

4x + 6 = 10

4x = 10 − 6 = 4

x= $\frac{4}{4}$ = 1

(ii) 3x + 2 = x + 8
Solution
3x + 2 = x + 8
3x − x = 8 − 2
2x = 6
x = 3

(iii) $\frac{5x-3}{4} = \frac{4x-3}{3}$
Solution
$\frac{5x-3}{4} = \frac{4x-3}{3}$
3(5x − 3)= 4(4x − 3)
15x − 9 = 16x − 12
-x = -3

x = 3

(iv) $\frac{1}{5}(2x - 1) - \frac{1}{4}(3x - 4) = 0$
solution
$\frac{1}{5}(2x - 1) - \frac{1}{4}(3x - 4) = 0$

Multiplying through by 20

4(2x − 1) − 5(3x − 4) = 0
8x − 4 − 15x + 20 = 0
-7x = - 16
x = $\frac{16}{7}$

Revision exercise

1. Solve the following equation
    (a) 2x + 4 = 0 [x=3]
    (b) 5x-6 = 24 [x =2]
    (c) 3x + 2 = x + 8 [x =3]
    (d) 2x + 5 = 29 -10x [x= 2]
    (e) 3(x − 8) + 2(4x − 1) = 3 $\left[x = \frac{29}{11}\right]$
    (f) 3(2x − 5) − 4(x − 2) = 5(x − 8) [x = 11]
2. Solve the following equations
    (a) $\frac{5x-3}{4} = \frac{4x-3}{3}$ [x = 3]
    (b) $\frac{7}{1-x} = \frac{3}{x+2}$ $\left[x = -\frac{17}{4}\right]$
    (c) 2x + 3 + $\frac{5x-1}{4} = \frac{3x-2}{8}$ $\left[x = -\frac{24}{23}\right]$
    (d) $\frac{2x-3}{4} + \frac{6x-4}{3} = \frac{2x+5}{6}$ $\left[\frac{35}{26}\right]$
    (e) $\frac{1}{5}(x - 2) + \frac{1}{3}(5x - 4) = \frac{1}{2}x$ $\left[x = \frac{52}{41}\right]$
    (f) $\frac{3x+1}{2x-3} = \frac{6x+1}{4x-5}$ $\left[x = \frac{2}{5}\right]$
    (g) $\frac{4-x}{2x+3} = \frac{x-1}{3-2x}$ $\left[x = \frac{5}{4}\right]$

Thank you

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