PRACTICE FOR ESSENTIAL LINEAR EQUATION SOLVING. (mainly MERIT level)

Solve the following equations, showing all working clearly.

(a) $\frac{5x}{8} - \frac{3}{2} \geq \frac{x}{4} + 3$

(b) $5(x - 4) - 3(x + 8) > 2(4x - 6)$

(c) $5(2x + 3) > -2(1 - 3x)$

(d) $\frac{3x}{5} + \frac{4x}{3} = 2$

(e) Solve $\frac{8}{(x - 2)} = \frac{5}{(3x - 2)}$

(f) $\frac{5}{6} - \frac{(2x - 3)}{4} = \frac{2(3x - 5)}{3}$

(f) There are three numbers, A, B and C.
B is 3 times A and C is 8 more than A.
Altogether, A + B + C = 108.
Write an equation and solve it to find A, B and C.

(g) I have 3 consecutive odd numbers.
I add 4 times the smallest to 3 times the largest then subtract 5 times the middle one.
The answer is 16.
Write an equation and solve it to find the 3 numbers.

MODEL SOLUTIONS

(a) $\frac{5x}{8} - \frac{3}{2} \geq \frac{x}{4} + 3$

$8\left(\frac{5x}{8} - \frac{3}{2}\right) \geq 8\left(\frac{x}{4} + 3\right)$

$5x - 12 \geq 2x + 24$

$3x \geq 36$

$x \geq 12$

(b) $5(x-4) - 3(x+8) > 2(4x-6)$

$5x - 20 - 3x - 24 > 8x - 12$

$2x - 44 > 8x - 12$

$-32 > 6x$

$\frac{-16}{3} > x$

(c) $5(2x+3) > -2(1-3x)$

$10x + 15 > -2 + 6x$

$4x > -17$

$x > \frac{-17}{4}$

(d) $\frac{3x}{5} + \frac{4x}{3} = 2$

$15\left(\frac{3x}{5} + \frac{4x}{3}\right) = 15 \times 2$

$9x + 20x = 30$

$29x = 30$

$x = \frac{30}{29}$

(e) Solve $\frac{8}{(x-2)} = \frac{5}{(3x-2)}$

$8(3x-2) = 5(x-2)$

$24x - 16 = 5x - 10$

$19x = 6$

$x = \frac{6}{19}$

(f) $\frac{5}{6} - \frac{(2x-3)}{4} = \frac{2(3x-5)}{3}$

$12\left(\frac{5}{6} - \frac{(2x-3)}{4}\right) = 12\left(\frac{2(3x-5)}{3}\right)$

$10 - 3(2x-3) = 8(3x-5)$

$10 - 6x + 9 = 24x - 40$

$19 = 30x - 40$

$49 = 30x$

$\frac{49}{30} = x$

(f) There are three numbers, A, B and C.
B is 3 times A and C is 8 more than A.
Altogether, A + B + C = 108.
Write an equation and solve it to find A, B and C.

$B = 3A$ and $C = A + 8$

So if $A + B + C = 108$

Then $A + 3A + A + 8 = 108$

$\therefore \quad 5A + 8 = 108$

$5A = 100$

$A = 20$

so $B = 60$

and $C = 28$

(g) I have 3 consecutive odd numbers.
I add 4 times the smallest to 3 times the largest then subtract 5 times the middle one.
The answer is 16.
Write an equation and solve it to find the 3 numbers.

If x is odd , the next two are x + 2 and x + 4

So $4x + 3(x+4) - 5(x+2) = 16$

$4x + 3x + 12 - 5x - 10 = 16$

$2x + 2 = 16$

$2x = 14$

$x = 7$

the three numbers are:

7, 9, 11