

Opgave 204

Løs følgende ligninger:

1:

$$\begin{aligned}5 - x &= 11 \\ -x &= 6 \\ x &= -6\end{aligned}$$

2:

$$\begin{aligned}\frac{1}{2}(1 + x) &= 7 \\ \frac{1}{2}x + \frac{1}{2} &= 7 \\ \frac{1}{2}x &= 7 - \frac{1}{2} \\ x &= 13\end{aligned}$$

3:

$$\begin{aligned}-17 + 2x &= 15 \\ 2x &= 32 \\ x &= 16\end{aligned}$$

4:

$$\begin{aligned}4 - x &= 4 \\ -x &= 0 \\ x &= 0\end{aligned}$$

5:

$$\begin{aligned}x - 13 &= \frac{-1}{2} \\ x &= 13 - \frac{1}{2} \\ x &= \frac{25}{2}\end{aligned}$$

6:

$$\begin{aligned}-\frac{13}{4}x &= \frac{11}{2} \\ -\frac{13}{4}x &= \frac{22}{4} \\ -13x &= 22 \\ x &= \frac{22}{-13}\end{aligned}$$

7:

$$\begin{aligned}\frac{3}{4}x &= 6 \\ \frac{3}{4}x &= \frac{24}{4} \\ 3x &= 24 \\ x &= \frac{24}{3} \\ x &= 8\end{aligned}$$

8:

$$\begin{aligned}0,42x &= 1,26 \\ x &= \frac{1,26}{0,42} \\ x &= 3\end{aligned}$$

9:

$$\begin{aligned}7x - 21 &= 0 \\ 7x &= 21 \\ x &= 3\end{aligned}$$

10:

$$\begin{aligned}-3 * x &= 21 \\ x &= \frac{21}{-3} \\ x &= -7\end{aligned}$$

11:

$$\begin{aligned}2(-x) &= \frac{-1}{2} \\ -2x &= \frac{-1}{2} \\ x &= \frac{\frac{-1}{2}}{-2} \\ x &= \frac{1}{4}\end{aligned}$$

12:

$$\begin{aligned}x\left(-\frac{7}{8}\right) &= \frac{-1}{4} \\ -\frac{7}{8}x &= -\frac{1}{4} \\ 7x &= 2 \\ x &= \frac{2}{7}\end{aligned}$$

Opgave 216

Løs ligningerne:

1:

$$\begin{aligned}\frac{3x+1}{5} - \frac{5x-3}{4} &= -1 \\ \frac{12x+4}{20} - \frac{25x-15}{20} &= -1 \\ \frac{19-13x}{20} &= -1 \\ 19-13x &= -20 \\ -13x &= -39 \\ x &= 3\end{aligned}$$

2:

$$\begin{aligned}\frac{y+2}{2y} - \frac{2y-4}{3y} &= \frac{1}{6} \\ \frac{3y+6}{6y} - \frac{4y-8}{6y} &= \frac{1}{6} \\ \frac{14-y}{6y} &= \frac{1}{6} \\ 6(14-y) &= 6y \\ 84-6y &= 6y \\ 12y &= 84 \\ y &= 7\end{aligned}$$

3:

$$\begin{aligned}\frac{8x-1}{2(2x+1)} &= \frac{3(2x-3)}{3x-4} \\ \frac{8x-1}{4x+2} &= \frac{6x-9}{3x-4} \\ (8x-1)(3x-4) &= (6x-9)(4x+2) \\ 24x^2 - 32x - 3x + 4 &= 24x^2 + 12x - 36x - 18 \\ -35x + 4 &= 24x - 18 \\ -11x &= -22 \\ x &= 2\end{aligned}$$

4:

$$\begin{aligned}\frac{5}{x} - \frac{2}{3} &= \frac{8}{x} - \frac{7}{6} \\ \frac{15 - 2x}{3x} &= \frac{48 - 7x}{6x} \\ 6x(15 - 2x) &= 3x(48 - 7x) \\ 90x - 12x^2 &= 144x - 21x^2 \\ 9x^2 - 54x &= 0 \\ x(9x - 54) &= 0 \\ x = 0 \vee 9x - 54 &= 0 \\ x = 0 \vee 9x &= 54 \\ x = 0 \vee x &= 6\end{aligned}$$

Opgave 225

Isoler x i nedenstående udtryk. For hvilken værdi af a kan det ikke lade sig gøre?

$$3 + 4x = ax + 5$$

$$4x - ax = 2$$

$$4x - x = \frac{2}{a}$$

$$x = \frac{\frac{2}{a}}{3}$$

$$a = \mathbb{R} \setminus \{0\}$$

Opgave 233

Løs hver af følgende ligninger:

1:

$$\begin{aligned}x(x - 2) &= 0 \\x = 0 \vee x - 2 &= 0 \\x = 0 \vee x &= 2\end{aligned}$$

2:

$$\begin{aligned}3x(x + 4) &= 0 \\3x = 0 \vee x + 4 &= 0 \\x = 0 \vee x &= -4\end{aligned}$$

3:

$$\begin{aligned}(x - 2)(x - 6) &= 0 \\x - 2 = 0 \vee x - 6 &= 0 \\x = 2 \vee x &= 6\end{aligned}$$

4:

$$\begin{aligned}(x - 1)(x + 8) &= 0 \\x - 1 = 0 \vee x + 8 &= 0 \\x = 1 \vee x &= -8\end{aligned}$$

5:

$$\begin{aligned}2(x - 5)(x - 1) &= 0 \\x - 5 = 0 \vee x - 1 &= 0 \\x = 5 \vee x &= 1\end{aligned}$$

6:

$$\begin{aligned}5(x + 3)x &= 0 \\x = 0 \vee x + 3 &= 0 \\x = 0 \vee x &= -3\end{aligned}$$