Gest BM 2M1: Gleichungen

(1) $9 - 10(7x+2) + 13(20-x) = 0$

$9 - 70x - 20 + 260 - 13x = 0$

$-83x + 249 = 0 \quad / + 83x$

$83x = 249$

$\underline{x = 3}$

(2) $(t-2)(t+5) = (t-3)(t+6)$

$t^2 - 2t + 5t - 10 = t^2 - 3t + 6t - 18 \quad / - t^2$

$3t - 10 = 3t - 18$

$-10 \neq -18 \Rightarrow$ <u>keine Lösung</u>

(3) $\frac{8x+3}{4} - \frac{3}{2} = \frac{5x+6}{3} - \frac{13}{3} \quad / \cdot 12$

$3(8x+3) - 6 \cdot 3 = 4(5x+6) - 4 \cdot 13$

$24x + 9 - 18 = 20x + 24 - 52 \quad / -20x + 9$

$4x = -19$

$\underline{x = -\frac{19}{4} = -4.75}$

(4) $25s + 18 - [3(s-4) - 4(2s+1)] = 94$

$25s + 18 - [3s - 12 - 8s - 4] = 94$

$25s + 18 - 3s + 12 + 8s + 4 = 94$

$30s + 34 = 94$

$30s = 60$

$\underline{s = 2}$

(5) $3x - \frac{2x+5}{7} = 16 - \frac{7x+19}{2} - \frac{2x+1}{3} \quad / \cdot 42$

$kgV(7,2,3) = 42$

$126x - 6(2x+5) = 16 \cdot 42 - 21(7x+19) - 14(2x+1)$

$126x - 12x - 30 = 672 - 147x - 399 - 28x - 14$

$114x - 30 = -175x + 259 \quad / +30 + 175x$

$289x = 289$

$x = 1$

(6) $L = 5.4\,km$

Hamilton: 5.4 km in $2'40'' = 160''$ =

Geschwindigkeit $= \frac{5400\,m}{160\,s} = 33.75\,\frac{m}{s}$

Vettel: 5.4 km in $2'30'' = 150''$

$v = \frac{5400\,m}{150\,s} = 36\,m/s$

Zeit bis Überrundung $= t$

Strecke Hamilton: $33.75\,\frac{m}{s} \cdot t$

" Vettel: $36\,\frac{m}{s} \cdot t$

Überrunden heisst, Vettel hat 1 Runde mehr:

Strecke Vettel − Strecke Ham. = 1 Runde

$36t - 33.75t = 5'400$

$2.25t = 5'400$

$t = 2400\,s = 40$ Minuten

(7)

VW + 5 = Opel

5 · BMW = Opel

BMW + 7 = Mercedes

VW + Opel + BMW + Mercedes = 134

↳ alles in "Opel umwandeln":

- VW + 5 = Opel ⇒ VW = Opel − 5
- 5 BMW = Opel ⇒ BMW = $\frac{1}{5}$ Opel
- Mercedes = BMW + 7

  BMW = $\frac{1}{5}$ Opel

  ⇒ Mercedes = $\frac{1}{5}$ Opel + 7

⇒ (Opel − 5) + Opel + $\frac{1}{5}$ Opel + ($\frac{1}{5}$ Opel + 7) = 134

$\frac{12}{5}$ Opel + 2 = 134

Opel = 55 | BMW = 11

VW = 50 | Merc = 18

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oder:

Opel = x BMW = $\frac{1}{5}$x VW = x − 5

Merc = $\frac{1}{5}$x + 7

x + $\frac{1}{5}$x + x − 5 + $\frac{1}{5}$x + 7 = 134

⋮

(8) $V + S = 100$ / $13S = 7V$

$V = 100 - S$

$13S = 7(100 - S)$

$13S = 700 - 7S$

$20S = 700$

$S = 35$ J. / $V = 65$ J.

oder:

Vater $= x \Rightarrow$ Sohn $= 100 - x$

$13(100 - x) = 7x$

$1300 - 13x = 7x$

$1300 = 20x$

$65 = x$

$35 = 100 - x$