1. Schulaufgabe 11 Klasse Mathematik 23.11.18

1) a) $5a \cdot (3-6b) + 2a$

$= 15a - 30ab + 2a$

$= 17a - 30ab$

b) $x(1-y) - (x+1)(1-y)$

$= x - xy - (x - xy + 1 - y)$

$= x - xy - x + xy - 1 + y$

$= -1 + y$

2) a) $2x^5 x^2 \cdot 2^4 = 2 \cdot 2^4 x^5 x^2 = 2^5 x^{10}$ falsch

$= 2^5 x^7$

b) $\left(\frac{2}{a^2}\right)^3 \cdot a^4 = \frac{8}{a^6} \cdot a^4 = \frac{8}{a^2}$ ✓ richtig

c) $\left(\frac{1}{2} xy^2\right)^2 - \frac{4}{16} = \frac{1}{4} x^2 y^4 - \frac{1}{4} = \frac{x^2 y^4}{\frac{1}{4} x^2 y^4 - \frac{1}{4}}$ falsch

3) a) $(a+7)^2 = a^2 + 14a + 49$

b) $(3 - 5x)^2 = 9 - 30x + 25x^2$

4) a) $8(x-1) - 6x = 3(10-x) - 8$

$8x - 8 - 6x + 30 - 3x - 8$

$2x - 8 = 22 - 3x \quad | + 3x + 8$

$5x = 30 \quad | : 5$

$x = 6 \in \mathbb{Z} \Rightarrow L = \{6\}$

4b) $\frac{1}{2}\left(x-\frac{1}{2}\right) = -2\left(\frac{1}{8}-\frac{1}{4}x\right)$

$\frac{1}{2}x - \frac{1}{4} = -\frac{1}{4} + \frac{1}{2}x \quad |-\frac{1}{2}x + \frac{1}{4}$

$0 = 0$

$\Rightarrow L = \mathbb{Z}$

c) $(x-5)^2 = (x-3)(x+3)$

$x^2 - 10x + 25 = x^2 - 9 \quad |-x^2 - 25$

$-10x = -34 \quad |:(-10)$

$x = 3{,}4 \notin \mathbb{Z} \quad \Rightarrow L = \{\ \}$

5) Clara: 12 J. , Tante: $3 \cdot 12\,J = 36$ J.

vor einigen Jahren: Clara: $12 - x$ J.

Tante: $36 - x$ J.

<u>und</u>: $(12-x)\cdot 4 = 36 - x$

$48 - 4x = 36 - x \quad |-36+4x$

$12 = 3x \quad |:3$

$4 = x$

$\Rightarrow$ Vor 4 Jahren war die Tante viermal so alt wie Clara.

Clara war 8 J. alt und die Tante 32 J.

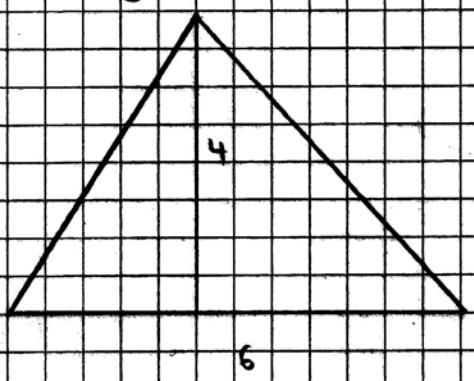
Mit TR:

1) $T(x) = \frac{2(1+x)^2}{3x} - x^2$

$T(-1) = \frac{2(1-1)^2}{3\cdot(-1)} - (-1)^2 = 0 - 1 = -1$

$T(5) = \frac{2(1+5)^2}{3\cdot 5} - (5)^2 = \frac{2\cdot 36}{15} - 25 = -20{,}2$

2) z.B.



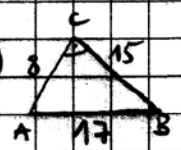
$\frac{1}{2}\cdot g\cdot h = 12$

$\Rightarrow g\cdot h = 24 = 4\cdot 6$
$= 3\cdot 8$

3) a) $a^2+b^2=c^2$

$8^2+15^2 = 289 = 17^2$ ✓

b)



$A_\Delta = \frac{1}{2}\cdot g\cdot h = \frac{1}{2}\cdot 8\cdot 15 = 60\ m^2$

c) $\gamma = 90°$

α : $\sin\alpha = \frac{15}{17} \Rightarrow \alpha \approx 61{,}93°$

β : $\sin\beta = \frac{8}{17} \Rightarrow \beta \approx 28{,}07°$

alternativ: $\beta = 180° - \gamma - \alpha = 28{,}07°$