II Ubungsaufgaben

1. Berechnen Sie die Termwerte und vereinfachen Sie so weit wie möglich.

1. a)
$$T(x) := \frac{x^2 - 6x}{x - 4}$$

 $T(-2) = \frac{(-2)^2 - 6 \cdot (-2)}{(-2) - 4} = \frac{4 + 12}{-6} = \frac{16}{-6} = \frac{2 \cdot 8}{2 \cdot 3} = \frac{8}{3}$

1.b)
$$T(x) = \frac{7x - 4}{x^2 - 25}$$

 $\frac{7}{2}(-5) - a - 35 - a - 35 - a$

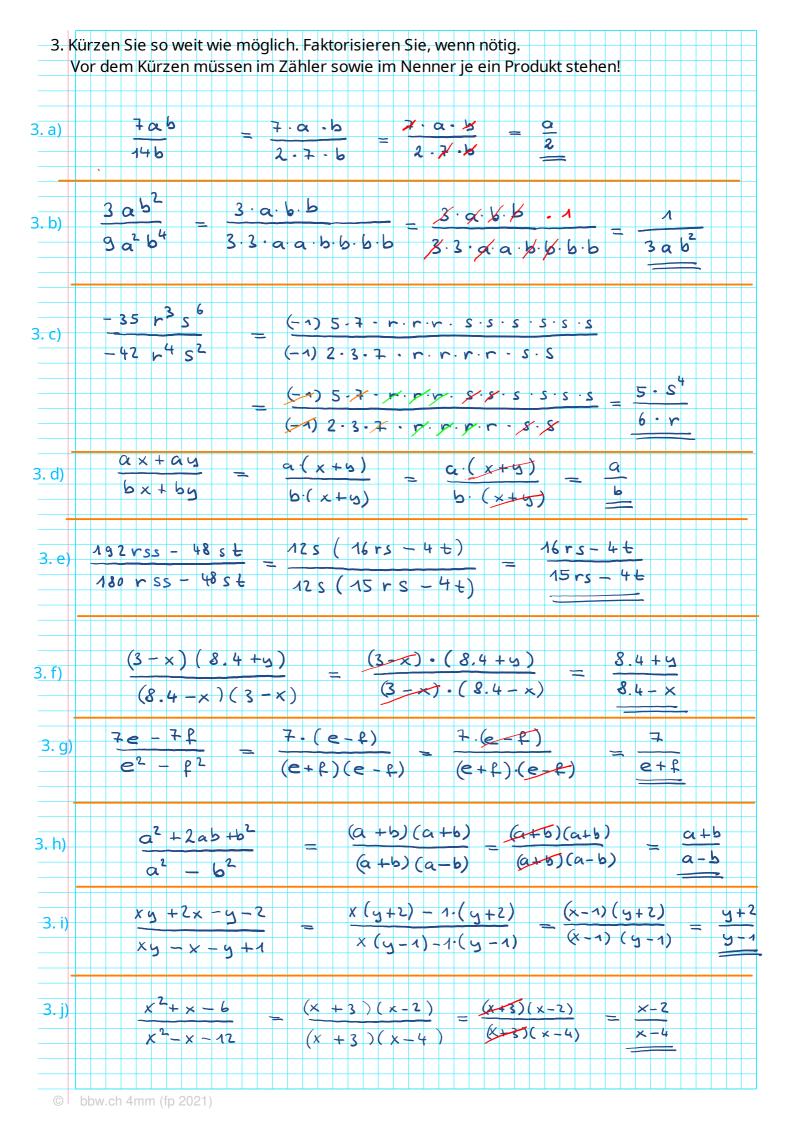
$$T(-5) = \frac{7 \cdot (-5) - a}{(-5)^2 - 25} = \frac{-35 - a}{25 - 25} = \frac{-35 - a}{(wir dür fen in R)}$$

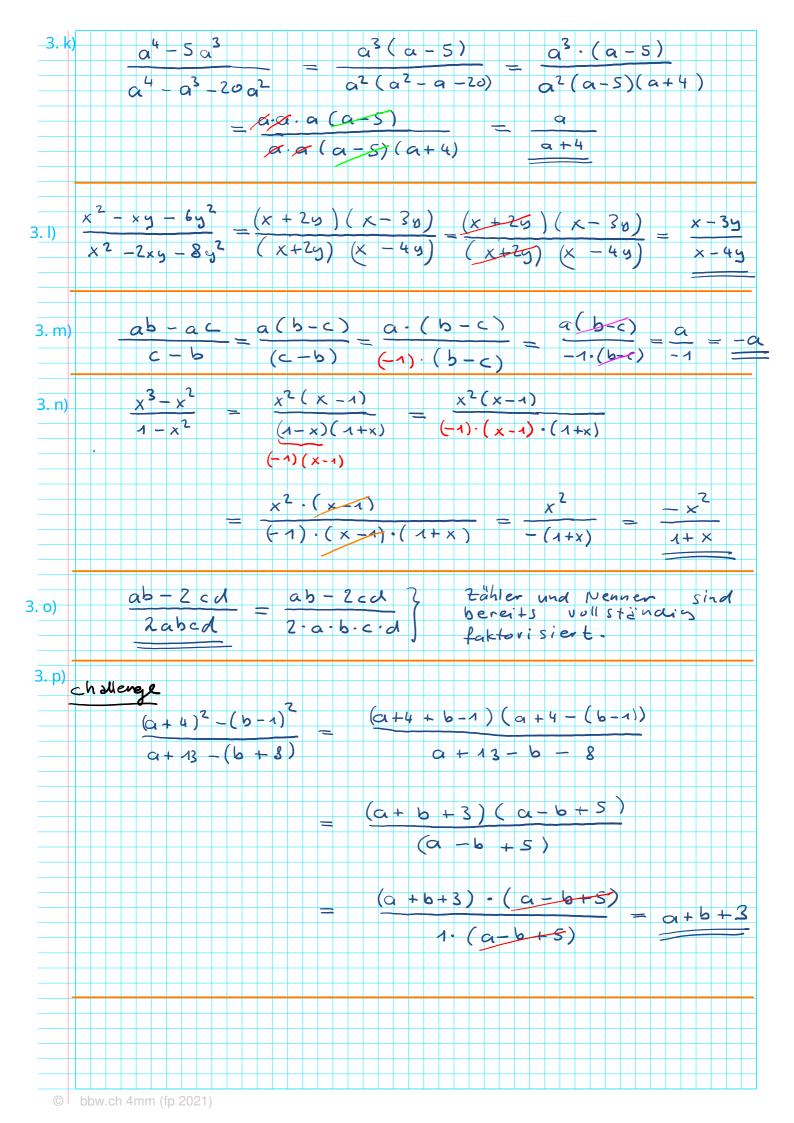
1.c)
$$T(x) := \frac{5 \times (a - x)(x + 3)(x - 4)}{25 (a - x)(x + 3)(x + 6)}$$

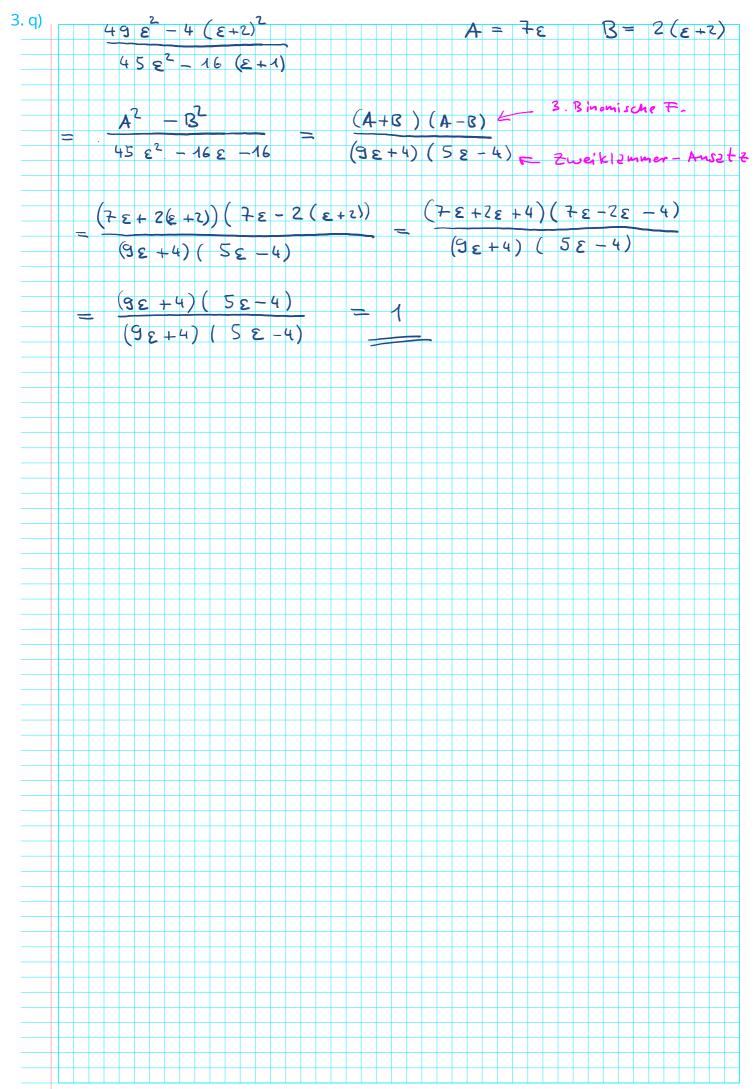
$$T(3) = \frac{5 \times (a \times)(x+3)(x+4)}{5 \cdot (x+3)(x+6)} = \frac{x(x-4)}{5(x+6)} = \frac{3((3)-4)}{5((3)+6)}$$

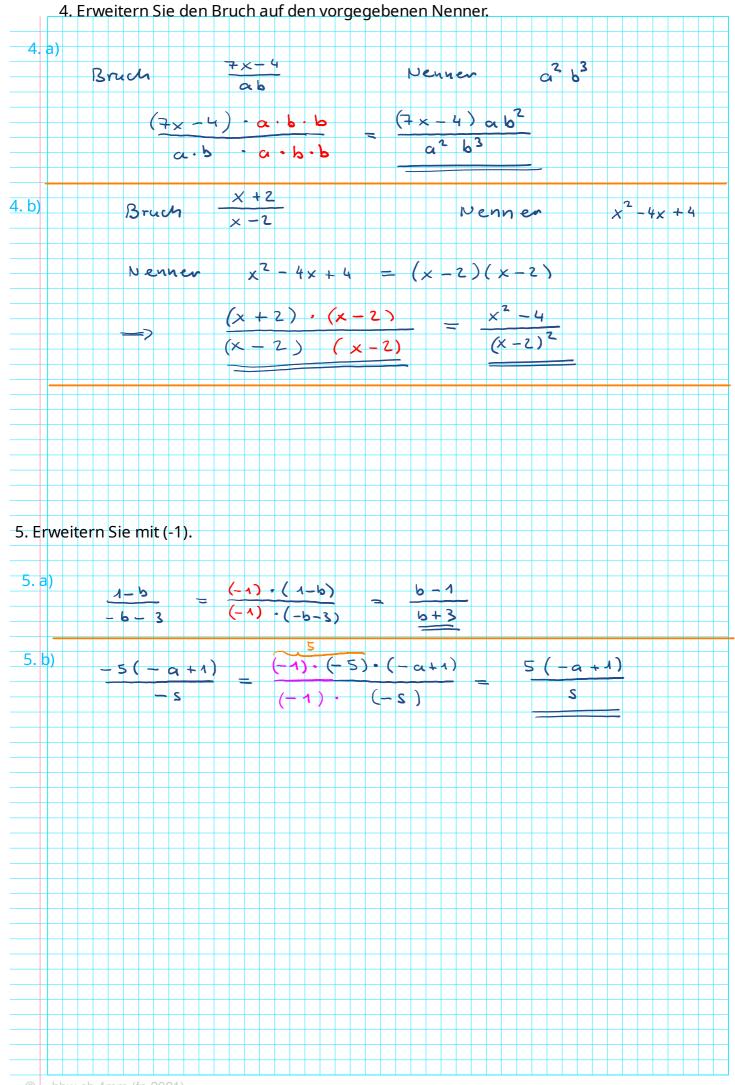
$$\frac{3 \cdot (-1)}{5 \cdot 9} = \frac{-3 \cdot 1}{5 \cdot 3} = \frac{1}{15}$$

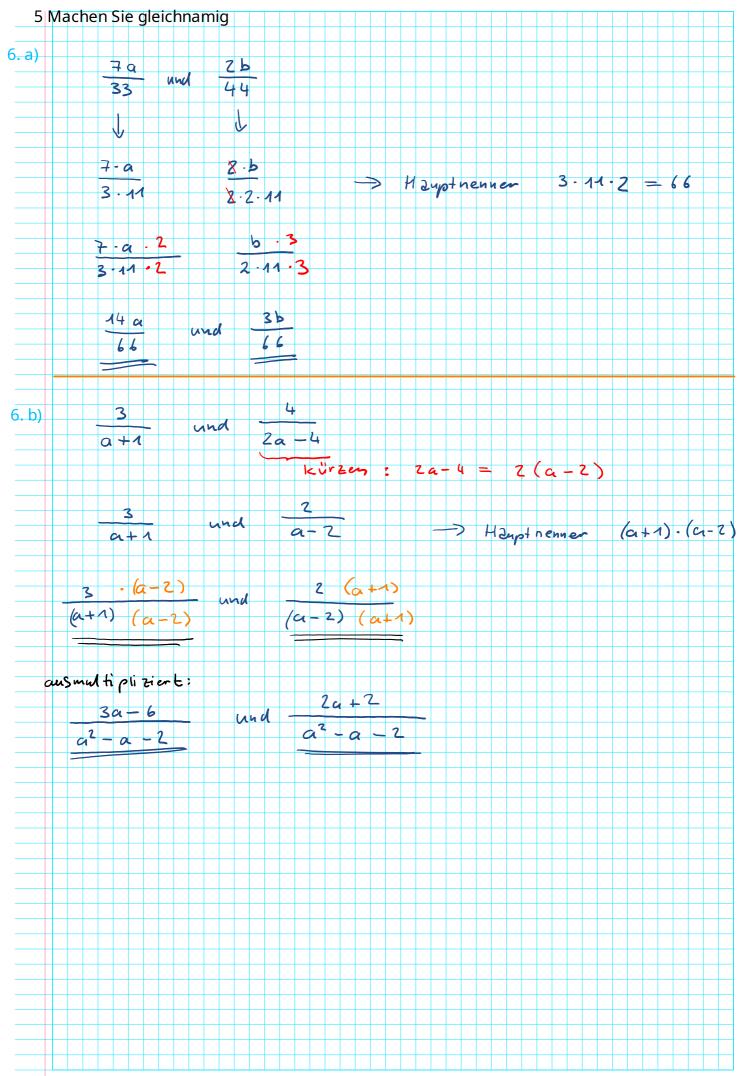
(Alle folgenden Brüche sind	nicht kurzbar.)		\blacksquare
a)	7 + ×	- L	Summe	
	8+× 24(7+×)		Produkt	
)	(8+x) A3	× J	Produkt	
<u> </u>	7×	ρ	Produkt	
	7+X		Summe	
	$a(-1)\sqrt{x+3}$		Produk+	
d)	x + 3 · 4b	+	Summe	
	× ² + 1	ρ	Summe	
)	x - 1		Summe Differenz	
	2 × -36		Different	
f)	2 x - 3 b 3 b · (2x)		Different Produkt	
3)	6 (4-x)	\bowtie \checkmark	Produkt	
37	$7(x+5)^2$		Produkt	
1)	x2 (a-c)	n <u>l</u>	Produkt	
	$x^2 \cdot a - c$	- \	Differenz	
i)	6-a (a ² -3)	$\bowtie \sqrt{}$	Produkt Produkt	
	a^{2} - b $(a-4)^{2}$		Product	
j)	8 (×-4)	ρ	Produkt	
	- x - 4		Differenz	
<)	8 (x - 4)	Ø.J	Produkt Produkt	\Box
110	(-1) (x+4)			



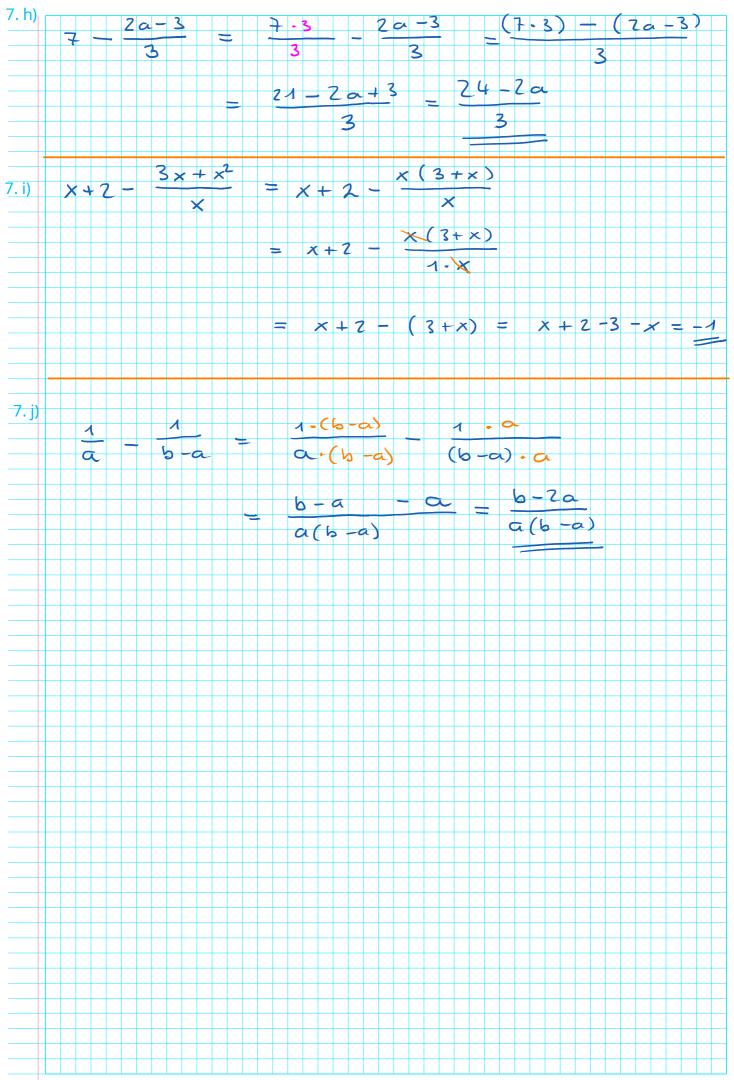


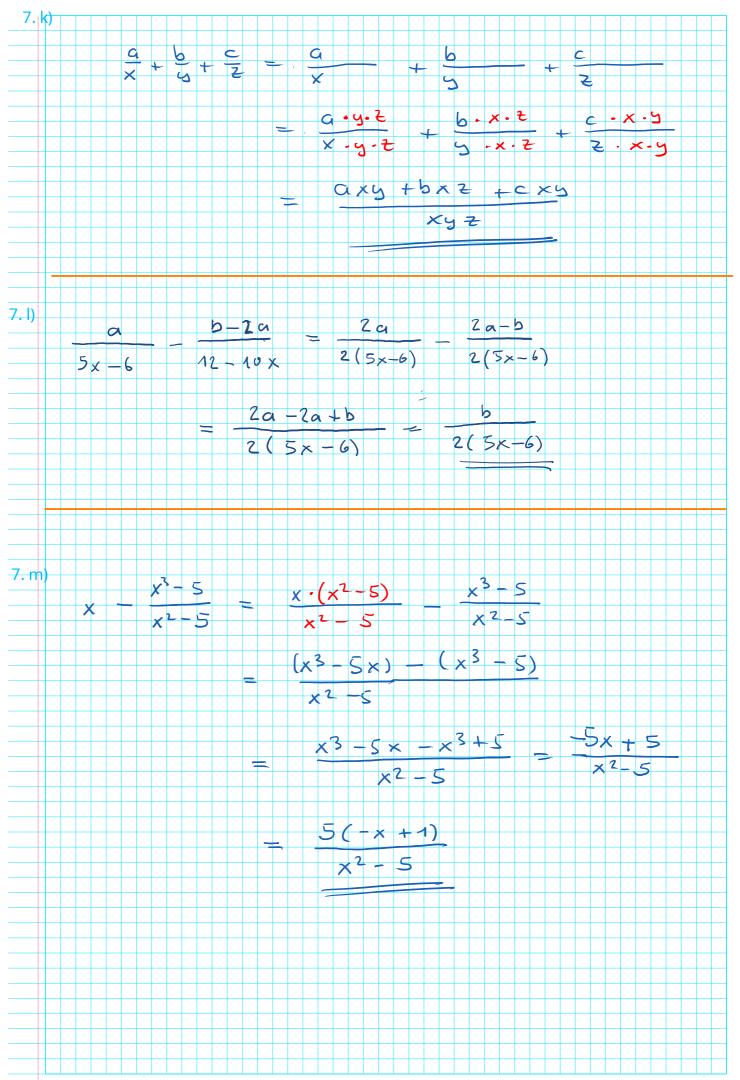




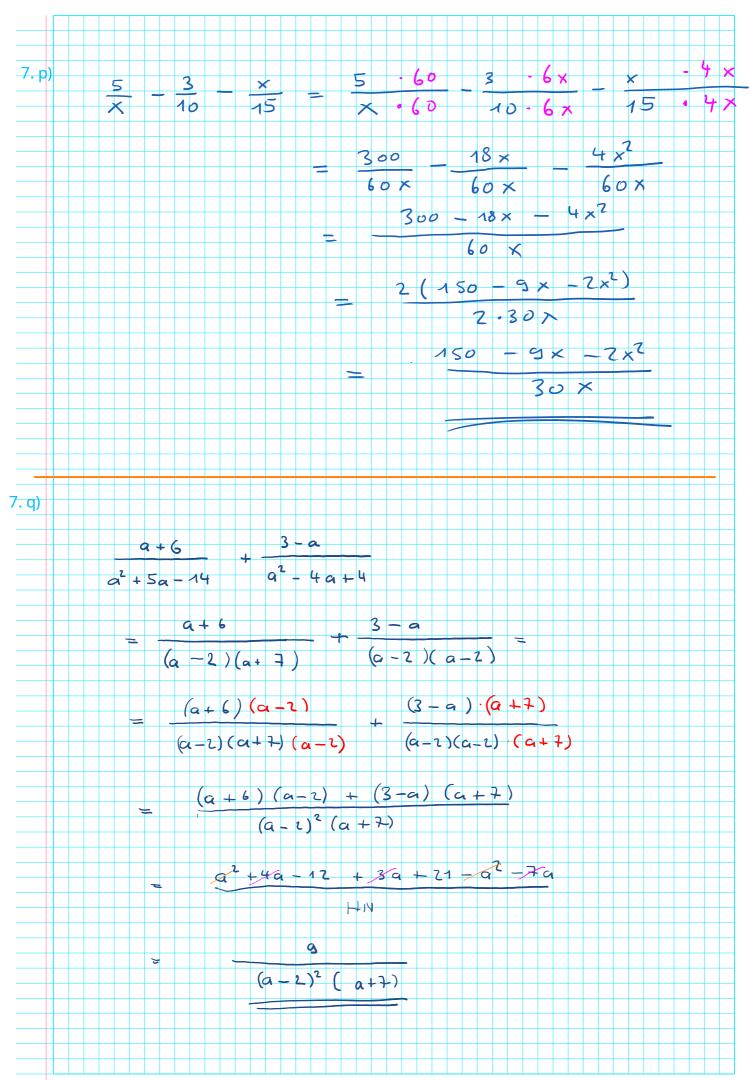


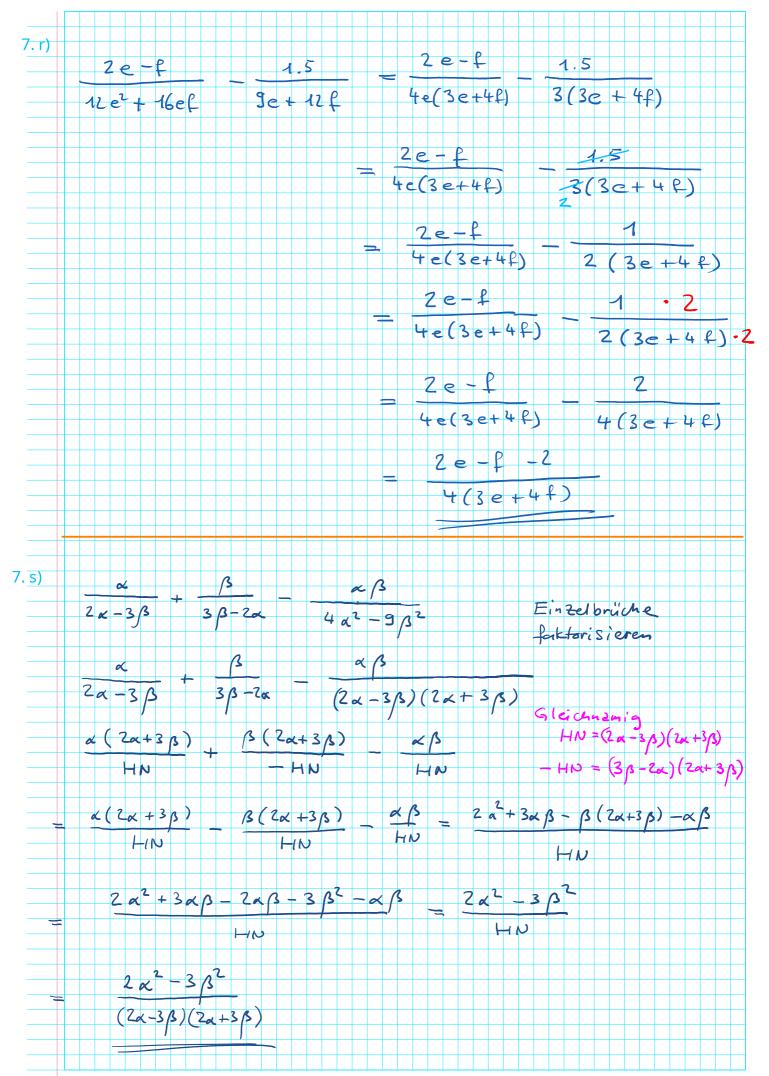
Addition/Subtraktion 7. Addieren bzw. subtrahieren Sie die folgenden Bruchterme 7. a 28-9 12 3 +4a 7. b) 12 7. c) Hauptnenner = 60 20 -5 + 12 x 5.12 7. d) $(7\times \cdot 5) - (6\cdot 3\cdot 5) + (2\cdot 3)$ 35x - 90 + 6 3.5.11 165 7. e) (a+2b) - (a-2b) a+26-a+26 $\frac{97}{65} \left(+ R \right)$ $\left(\frac{4}{5} + \frac{9}{13} \right) \cdot \times =$ 7. f) 7b . b 26





7. n)			
	a + 3 b	5a + 15b	
	a2 + 6ab+9b2	5. + 15h	
	a + 6a6+96	34 (1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
			1 MTA S. 59
	at3b	a-b	Aufer.
	(a+3b)(a+3b)	5(a+36)	Anfg. 24.a)
			24.a)
	160 (26)	a-b	
	$= \frac{1.(a+3b)}{(a+3b)(a+3b)}$	5(a+36)	
	7 · 5 (C1+3b) 5	a-b	
	= (a+36)5	5 (a+3b)	
	5 -	(a-b) = 5-a	+ 6
	= 5(a+		36)
7. o)	, ,	2	
	m ² + 6m ⁻ =	m ² 6 m m 1 2 6 m	
	$\frac{m^2}{m-1} + \frac{6m^2}{12m} =$	m-1 2-6-m	
		m² 6. m·m	
	-	m² + 6· m· m m-1 2-6-m	
		$\frac{m^2 \cdot 2}{(m-1) \cdot 2} + \frac{m \cdot (m-1)}{2 \cdot (m-1)}$	
		$(m-1)\cdot 2$ 2 · $(m-1)$	
	H	$2m^2 + m(m-1) = 2m$	+ m - m
		Z(m-1)	Z(m-1)
		2 m ² - m m (3 m -	1
	-	$\frac{3m^2-m}{2(m-1)}$ $\frac{m(3m-1)}{2(m-1)}$	$\stackrel{\checkmark}{\leftarrow}$
		2(m-1)	





Multiplikation

8. Multiplizieren Sie die Bruchterme

8. a)
$$\alpha$$
 $c-\alpha$ α $(c-\lambda)$ α

8. c)
$$\frac{x-3}{6x^3-18x^2} \cdot (-3x^2) = \frac{(x-3)}{6x^2(x-3)} \cdot 1$$

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

8. d)
$$(a-b) \cdot (b-a) = (a-b) \cdot 2 \cdot a = (-1) \cdot (b-a) \cdot 2 \cdot a = (b-a) \cdot 1$$

$$= (-1) \cdot 2 \cdot a = -2 \cdot a$$

8. e)
$$\frac{-xy}{4x-4y}$$
 · (16 y - 16 x) = $\frac{-x \cdot y \cdot (16y-16 x)}{4x-4y}$

$$= -x \cdot y \cdot 16 \cdot (-1)(x - 9)$$

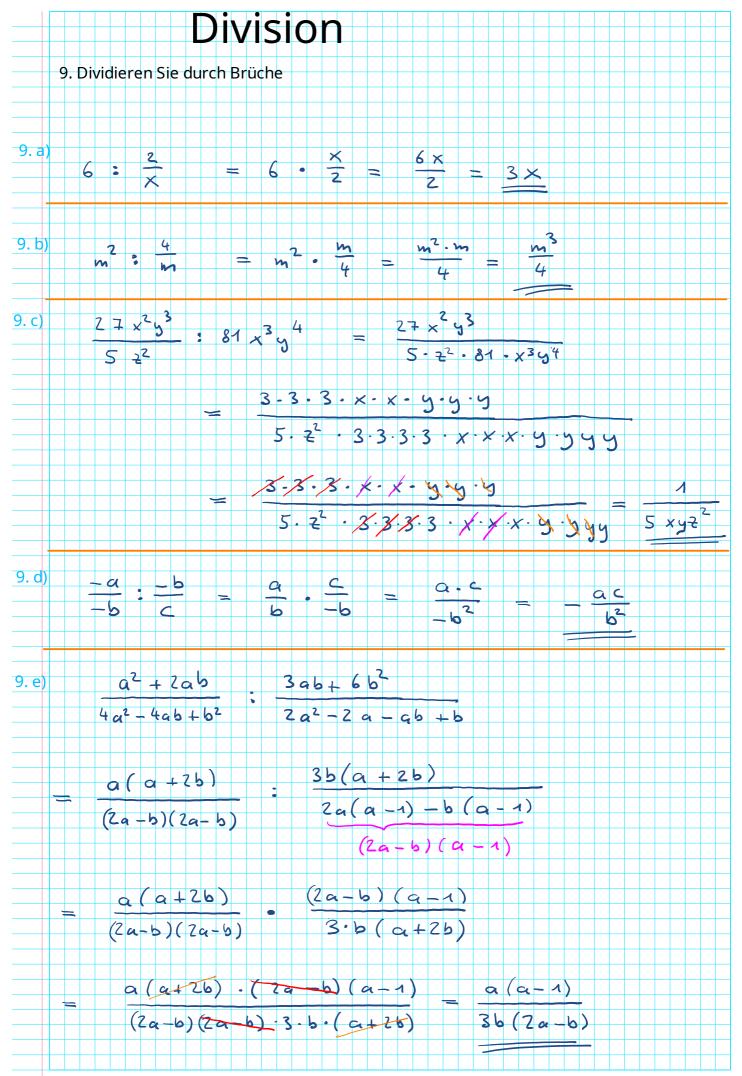
$$= -x \cdot y \cdot x \cdot 4 \cdot (-1)(x - 9)$$

$$= -x \cdot y \cdot x \cdot 4 \cdot (-1)(x - 9)$$

$$= -x \cdot y \cdot x \cdot 4 \cdot (-1)(x - 9)$$

$$= - \times \cdot y \cdot 4 \cdot (-1) = 4 \times y$$

8. f)	3× - 343	4 2 ² + 2 2 = 2 x ² - 2y ²	$3 \cdot (x-y)$ $2 = (2 = +1)$ $2 \cdot 2 $ $2(x^2-y^2)$
		=	3·(x-5)·2·2(22+1) 2·2·2·(x²-5²)
		=	3·(x-4)·2·2(22+1)
			$2 \cdot 2 \cdot 2 \cdot (x + y)(x - y)$ $3 \cdot (x - 5) \cdot 2 \cdot $
		=	2.76·2·(x+y)(x-y) 3·(22+1)
			2·(×+5)
© bb	w.ch 4mm (fp 2021)		



Doppelbrüche

10. Vereinfachen Sie so weit wie möglich.

10.b)
$$\frac{1}{1+\frac{1}{5}} = 1: \left(\frac{1}{1} + \frac{1}{2}\right) = 1: \left(\frac{9}{15} + \frac{1}{15}\right)$$

$$= 1 = \begin{pmatrix} 9+1 \\ 19 \end{pmatrix} = 1 \cdot \frac{19}{9+1} = \frac{19}{9+1}$$

$$\frac{10.\epsilon}{1-\frac{\epsilon}{a}} = 1: \left(1-\frac{\epsilon}{a}\right) = 1: \left(\frac{\alpha}{a}-\frac{\epsilon}{a}\right)$$

$$= 1 : \left(\begin{array}{c} a - 1 \\ a \end{array}\right) = 1 \cdot \begin{array}{c} a \\ a - 1 \end{array} = \begin{array}{c} a \\ a - 1 \end{array}$$

10. d)
$$x + \frac{1}{2}$$
 = $(x + \frac{1}{2}) = (x - \frac{1}{2})$

$$= \left(\frac{2}{2} + \frac{1}{2}\right) \cdot \left(\frac{2}{2} + \frac{1}{2}\right)$$

$$=$$
 $\frac{2 \times +1}{2}$: $\frac{2 \times -1}{2}$ = $\frac{2 \times +1}{2}$ · $\frac{2 \times -1}{2 \times -1}$

$$= \frac{2 \times +1}{2 \times -1}$$

alternativen

$$2 \cdot \left(x + \frac{1}{2}\right)$$

$$\times -\frac{1}{2}$$
 2. $\left(\times -\frac{1}{2}\right)$

Gemischte Aufgaben

11. Vereinfachen Sie so weit wie möglich.

$$\begin{array}{c|c}
11. a) & 2 \times y & \left(\frac{x}{2y} - \frac{y}{2x}\right)
\end{array}$$

$$= 2 \times 9 \cdot \left(\frac{\times \times}{29 \cdot \times} - \frac{9 \cdot 9}{2 \times 9} \right)$$

$$= 2 \times 9 \cdot \left(\frac{x^2 - 9^2}{2 \times 9} \right) = 2 \times 9 \cdot \left(\frac{x^2 - 9^2}{2} \right)$$

$$= x^2 - y^2 = (x + y)(x - y)$$

$$\begin{pmatrix} 1 & 1 & a \\ a & b \end{pmatrix}$$
, $\begin{pmatrix} b & a^2 \\ ab & ab \end{pmatrix}$, $\begin{pmatrix} ab & b+a^2 & ab \\ 7 & ab & 7 \end{pmatrix}$

$$= \frac{(b+a^2) \cdot ab}{ab \cdot 7} = \frac{b+a^2}{7}$$