

Punkteverteilung										
Aufgabe	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
Punkte	2	2	2	2	2	2	2	2	2	2

Musterlösung

1. $0,2 = \frac{9}{45} = \frac{1}{5} < \frac{2}{9} = \frac{10}{45} = 0,2$

2. a)
$$\begin{array}{r} 315 \cdot 4,5 \\ \underline{1260} \\ 1575 \\ \underline{1417,5} \end{array}$$

b)
$$\begin{array}{r} 2103 : 0,3 \\ 21030 : 3 = 7010 \\ \underline{21} \\ 00 \\ \underline{00} \\ 03 \\ \underline{03} \\ 00 \end{array}$$

3.
$$\begin{aligned} & (-3) - (-5) \cdot \sqrt{13 + (2 \cdot (7-4))^2} \\ & = (-3) - (-5) \cdot \sqrt{13 + (2 \cdot 3)^2} \\ & = (-3) - (-5) \cdot \sqrt{13 + (6)^2} \\ & = (-3) - (-5) \cdot \sqrt{13 + 36} \\ & = (-3) - (-5) \cdot \sqrt{49} \\ & = (-3) - (-5) \cdot 7 \\ & = (-3) + 35 = 32 \end{aligned}$$

4. a)
$$\frac{5}{4} + \frac{7}{12} = \frac{15+7}{12} = \frac{22}{12} = \frac{11}{6} = 1\frac{5}{6}$$

b)
$$\frac{10}{y} : \frac{5}{3} = \frac{10}{y} \cdot \frac{3}{5} = \frac{6}{y} \quad y \in \mathbb{R} \setminus \{0\}$$

5. a) $10^4 \cdot 10^{-2} = 10^{4+(-2)} = 10^2 = 100$

c)
$$\frac{a^{0,5}}{a^{2,5}} = a^{0,5-2,5} = a^{-2} = \frac{1}{a^2}$$

b) $(x+y)^0 = 1$

d)
$$\frac{a^2 - b^2}{a-b} \cdot \frac{a-b}{a+b} \stackrel{\text{Kürzen}}{=} \frac{a^2 - b^2}{a+b} \stackrel{\text{3. binomische Formel}}{=} \frac{(a-b)(a+b)}{a+b} \stackrel{\text{Kürzen}}{=} a-b$$

6. a) $(x-5)(2x+6) = 0$

\Rightarrow 1. Fall: $x-5 = 0 \Leftrightarrow x_1 = 5$

\Rightarrow 2. Fall: $2x+6 = 0 \Leftrightarrow x_2 = -3$

\Rightarrow $IL = \{5; -3\}$

b) $x^2 - 8x + 16 = (x-4)^2 = 0 \Leftrightarrow x = 4$

\Rightarrow $IL = \{4\}$

7. a)
$$\frac{3}{x} = \frac{4}{5} \Rightarrow x = \frac{15}{4} = 3\frac{3}{4}$$

b)
$$\begin{aligned} -4x^2 + 22x - 23 &= 5 & | -5 \\ -4x^2 + 22x - 28 &= 0 & | :(-4) \\ x^2 - \frac{11}{2}x + 7 &= 0 & | pq \end{aligned}$$

$$x_{1/2} = \frac{11}{4} \pm \sqrt{\frac{121}{16} - 7} = \frac{11}{4} \pm \sqrt{\frac{121}{16} - \frac{112}{16}}$$

$$x_{1/2} = \frac{11}{4} \pm \sqrt{\frac{9}{16}} = \frac{11}{4} \pm \frac{3}{4}$$

$$\Rightarrow x_1 = \frac{14}{4} = \frac{7}{2}, \quad x_2 = \frac{8}{4} = 2$$

8.
$$\begin{array}{l} A = 2a^2 + 4ah \quad | -2a^2 \\ A - 2a^2 = 4ah \quad | :4a \end{array}$$

$$h = \frac{A - 2a^2}{4a} = \frac{A}{4a} - \frac{a}{2}$$

9. Umfang $U = 2a + 2b = 2(a + b)$

$\Rightarrow 9 = 2(a + b)$

$\Rightarrow b = 4,5 - a$

Fläche $A = a \cdot b$

$\Rightarrow 4,5 = a \cdot (4,5 - a)$

$\Rightarrow 4,5 = 4,5a - a^2$

$\Rightarrow a^2 - 4,5a + 4,5 = 0$

Mit der pq-Formel ergibt sich:

$a_1 = 3 \text{ cm}$ und $a_2 = 1,5 \text{ cm}$.

10. a)

$g(x) = 3x - 1$

$f(x) = (x-1)^2 - 3$

b)

siehe Abbildung \Rightarrow

