

1. Berechnen Sie/Find x

$$x = 1 + \frac{\frac{1}{3}}{0.5 \cdot \frac{4}{9}}$$

2. Berechnen Sie/Find x

$$\frac{3x-16}{3} + \frac{2x-10}{5} = 3 - \frac{x+1}{15}$$

3. Berechnen Sie/Find x

$$(x+5)(3x^2 + 12x + 9) = 0$$

4. Berechnen Sie/Find x

$$|4x - 1| = x + 2$$

5. Berechnen Sie alle x mit:/Find all x

$$\left|x - \frac{4}{3}\right| + \frac{2}{3} \leq 1$$

6. Berechnen Sie/Find x

$$6\sqrt{3^x} - 9 = 3^x \quad (\sqrt{3^x} = u)$$

7. Berechnen Sie/Find x

$$2\sqrt[4]{x} = \frac{\sqrt{x}}{2} + 2 \quad (\sqrt[4]{x} = u)$$

8. Eine Gerade geht durch die Punkte (0,1) und (3,2). Bestimmen Sie die Steigung der Geraden/A straight line passes through the points (0,1) and (3,2). Calculate the slope.

9. Eine Gerade geht durch die Punkte (-1,-1) und (1,3). Bestimmen Sie die Gleichung der Geraden in der Form  $y=ax+b$ /A straight line passes through the points (0,1) and (3,2). Write down the equation of the line in the form  $y=ax+b$ .

10. Ein Vater ist jetzt zweimal so alt wie sein Sohn. Vor fünfzehn Jahren war der Vater dreimal so alt wie sein Sohn. Wie alt war der Vater bei der Geburt des Sohnes? /A father is now twice as old as his son. Fifteen years ago the father was three times as old as his son. How old was the father when the son was born?

11. Berechnen Sie/Find x

$$x = (3 - \sqrt{2})(2 + 3\sqrt{2})$$

**A:**  $x = 22$

**B:**  $x = 14$

**C:**  $x = 11\sqrt{2}$

**D:**  $x = 7\sqrt{2}$

12. Vereinfachen Sie/ Simplify

$$\left(\frac{4b^2y^2}{6a^2x^2}\right)^3 \left(\frac{8a^3y^2}{6b^3x^3}\right)^4 \left(\frac{18b^3x^6}{16a^3y^3}\right)^2$$

**A:**  $x = \frac{32y^8}{27x^6}$

**B:**  $x = \frac{16y^8}{27x^6}$

**C:**  $x = \frac{32y^6}{27x^6}$

**D:**  $x = \frac{16y^6}{27x^6}$

13. Vereinfachen Sie/ Simplify

$$\left(\frac{y^8a^4}{16}\right)^{\frac{1}{4}}$$

**A:**  $x = \frac{y^2a}{4}$

**B:**  $x = \frac{y^2a}{2}$

**C:**  $x = \frac{y^2}{4}$

**D:**  $x = \frac{y^2}{2}$

14. Vereinfachen Sie/ Simplify

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

**A:**  $2x^2 + 8x$

**B:**  $2x^2 - 8$

**C:**  $2x^2 + 8$

**D:**  $2x^2 - 8x$

15. Berechnen Sie/ Calculate

$$(-2x^3 - 9x^2 - 10x - 24) : (x + 4)$$

**A:**  $-2x^2 - x + 6$

**B:**  $-2x^2 - x - 6$

**C:**  $-2x^2 + x - 6$

**D:**  $2x^2 - x - 6$

16. Berechnen Sie Y:/ Find Y:

$$Y = 1 + \tan^2(\pi) - \frac{1}{\cos^2(\pi)}$$

**A:**  $Y = 1$

**B:**  $Y = 0$

**C:**  $Y = -1$

**D:**  $Y = 2$

17. Berechnen Sie Y:/ Find Y:

$$Y = \tan^2\left(n\frac{\pi}{4}\right) \frac{\sin\left(n\frac{\pi}{2}+x\right)}{\sin\left(n\frac{\pi}{2}-x\right)}, \quad n = 1,3,5,7.. \text{ und } 0 \leq x \leq \pi/2$$

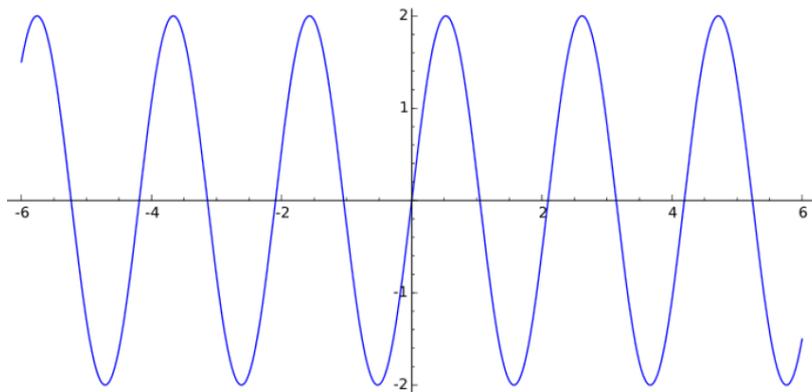
**A:**  $Y = 1$

**B:**  $Y = 0$

**C:**  $Y = 2$

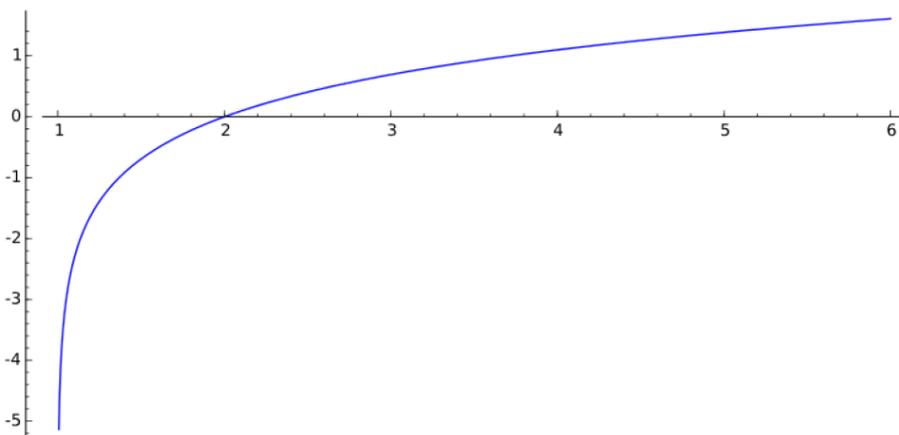
**D:**  $Y = -1$

18. Um welche Funktion handelt es sich?/ Which function is shown below?



A:  $f(x) = 2\sin(\frac{x}{3})$    B:  $f(x) = 2\sin(3x)$    C:  $f(x) = 3\sin(2x)$    D:  $f(x) = 3\sin(\frac{x}{2})$

19. Um welche Funktion handelt es sich?/ Which function is shown below?



A:  $f(x) = \ln(x) + 1$    B:  $f(x) = \ln(x) - 1$    C:  $f(x) = \ln(x - 1)$    D:  $f(x) = \ln(x + 1)$

20. Bestimmen Sie die Lösung des Gleichungssystems/Find the solution of the system of equations

$$\begin{aligned} x - y - z &= 4 \\ 2y + z &= -1 \\ -x + y - 2z &= 5 \end{aligned}$$

21. Zeichnen Sie die Graphen der angegebenen Funktionen/Sketch the graphs of the given functions

(a)  $f(x) = \frac{1}{4}x + \frac{7}{4}$    (b)  $f(x) = -x^2 + 2$    (c)  $f(x) = (\frac{1}{3})^x$    (d)  $f(x) = \sqrt[3]{x}$

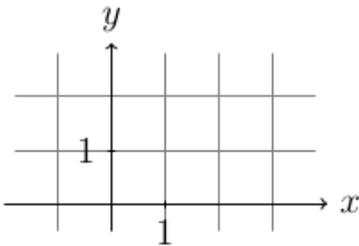
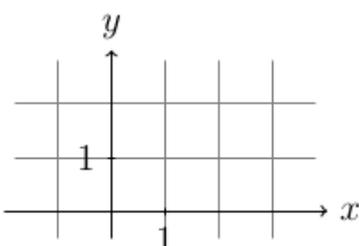
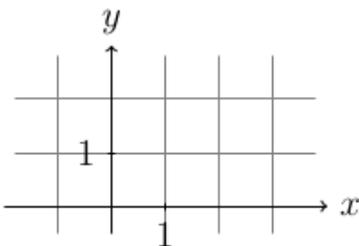
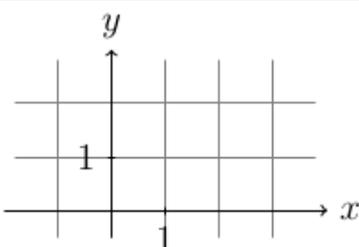
22. Bestimmen Sie a, b und c./Find a, b, and c.

$$2x^2 + 8x + 4 = a(x - b)^2 + c$$



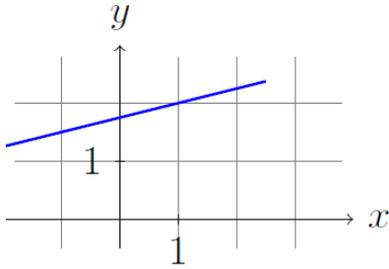
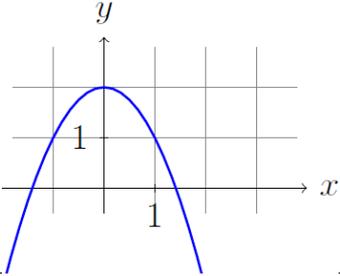
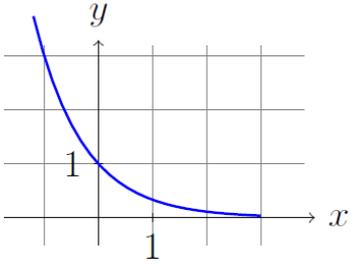
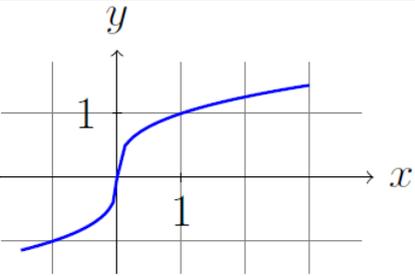
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**MUSTERLÖSUNG**

1	$x=5/2$	1
2	$x=7$	1
3	-5; -3; -1	2
4	-1/5; 1	2
5	$1 \leq x \leq 5/3$	1
6	$x=2$	1
7	$x=16$	1
8	$1/3$	1
9	$y=2x+1$	3
10	30	1
11	<b>D</b> ( $x = 7\sqrt{2}$ )	1
12	<b>A</b> ( $x = \frac{32y^8}{27x^6}$ )	2
13	<b>B</b> ( $x = \frac{y^2a}{2}$ )	1
14	<b>C</b> ( $2x^2 + 8$ )	1

15	<b>B</b> $(-2x^2 - x - 6)$	1
16	<b>B</b> ( $Y = 0$ )	1
17	<b>A</b> ( $Y = 1$ )	1
18	<b>B</b>	1
19	<b>C</b>	1
20	$(x, y, z) = (2, 1, -3)$ oder $x = 2, y = 1, z = -3$	3
21 a		1
b		2
c		2
d		2
22	$a = 2, b = -2, c = -4$	2
		$\Sigma$ 36

