

FLÄCHE & UMFANG D KREISES

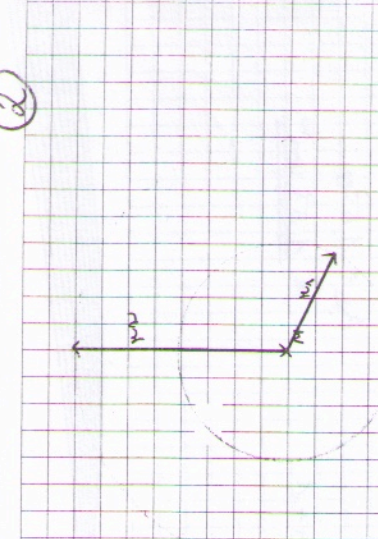
- 1) $u = 2 \cdot x_1 \cdot \pi$
 $A = x_1^2 \cdot \pi$
- 2) $x = 2,5 \text{ m}$
 $u = 2 \cdot x \cdot \pi$
 $u = 2 \cdot 2,5 \cdot \pi$
 $u = 15,708$
 $\approx 15,71 \text{ m}$
- 3) $d = 6,4 \text{ m}$
 $x = d : 2$
 $x = 6,4 : 2$
 $x = 3,2 \text{ m}$
 $u = 2 \cdot x \cdot \pi$
 $u = 2 \cdot 3,2 \cdot \pi$
 $u = 20,106$
 $\approx 20,11 \text{ m}$
- 4) $x = 30 \text{ m}$
 $u = 2 \cdot x \cdot \pi$
 $u = 2 \cdot 30 \cdot \pi$
 $u = 188,495$
 $\approx 188,5 \text{ m}$
- 5) $d = 19 \text{ cm}$
 $x = d : 2$
 $x = 19 : 2$
 $x = 9,5 \text{ cm}$
 $u = 2 \cdot x \cdot \pi$
 $u = 2 \cdot 9,5 \cdot \pi$
 $u = 59,812$
 $\approx 59,81 \text{ cm}$

- 6) $140 + 10 = 160 \text{ cm}$
 $d = 160 \text{ cm}$
 $x = d : 2$
 $x = 160 : 2$
 $x = 80 \text{ cm}$
- 7) $x = 7,3 \text{ cm}$
 $A = x^2 \cdot \pi$
 $A = 7,3^2 \cdot \pi$
 $A = 167,415$
 $\approx 167,42 \text{ cm}^2$
- 8) $x = 2,5 \text{ m}$
 $A = x^2 \cdot \pi$
 $A = 2,5^2 \cdot \pi$
 $A = 19,635$
 $\approx 19,63 \text{ m}^2$

KREISRING

- 1) $x_1 = 4 \text{ cm}$
 $x_2 = 2 \text{ cm}$
 $u = 2 \cdot x_1 \cdot \pi + 2 \cdot x_2 \cdot \pi$
 $u = 2 \cdot 4 \cdot \pi + 2 \cdot 2 \cdot \pi$
 $u = 34,911$
 $\approx 34,91 \text{ cm}$
- 2a) $x_1 = 19 \text{ cm}$
 $x_2 = 11 \text{ cm}$
 $A = 2 \cdot x_1 \cdot \pi + 2 \cdot x_2 \cdot \pi$
 $A = 2 \cdot 19 \cdot \pi + 2 \cdot 11 \cdot \pi$
 $A = 188,495$
 $\approx 188,5 \text{ cm}$
- b) $x_1 = 85 \text{ cm}$
 $x_2 = 35 \text{ cm}$
 $A = 2 \cdot x_1 \cdot \pi + 2 \cdot x_2 \cdot \pi$
 $A = 2 \cdot 85 \cdot \pi + 2 \cdot 35 \cdot \pi$
 $A = 753,982$
 $\approx 753,98 \text{ cm}$
- 3) $x_1 = 6 \text{ cm}$
 $x_2 = 19 \text{ cm}$
 $A = x_1^2 \cdot \pi - x_2^2 \cdot \pi$
 $A = 6^2 \cdot \pi - 19^2 \cdot \pi$
 $A = 104,456$
 $\approx 104,46 \text{ cm}^2$
- 4) $x_2 = 3,5 \text{ m}$
 $x_1 = 3,5 \text{ m}$
 $A = x_1^2 \cdot \pi - x_2^2 \cdot \pi$
 $A = 3,5^2 \cdot \pi - 3,5^2 \cdot \pi$
 $A = 0$

- 5) $x_1 = 19 \text{ cm}$
 $x_2 = 11 \text{ cm}$
 $A = x_1^2 \cdot \pi - x_2^2 \cdot \pi$
 $A = 19^2 \cdot \pi - 11^2 \cdot \pi$
 $A = 753,982$
 $\approx 753,98 \text{ cm}^2$
- 6) $x_1 = 85 \text{ cm}$
 $x_2 = 35 \text{ cm}$
 $A = x_1^2 \cdot \pi - x_2^2 \cdot \pi$
 $A = 85^2 \cdot \pi - 35^2 \cdot \pi$
 $A = 18849,555$
 $\approx 18849,56 \text{ cm}^2$
- 7) $x_1 = 6 \text{ cm}$
 $x_2 = 19 \text{ cm}$
 $A = x_1^2 \cdot \pi - x_2^2 \cdot \pi$
 $A = 6^2 \cdot \pi - 19^2 \cdot \pi$
 $A = 104,456$
 $\approx 104,46 \text{ cm}^2$
- 8) $x_2 = 3,5 \text{ m}$
 $x_1 = 3,5 \text{ m}$
 $A = x_1^2 \cdot \pi - x_2^2 \cdot \pi$
 $A = 3,5^2 \cdot \pi - 3,5^2 \cdot \pi$
 $A = 0$



A: Der beachtete Teil einer CD hat eine Fläche von $104,46 \text{ cm}^2$

A: Der Flächeninhalt des Weges beträgt $30,91 \text{ m}^2$

UMFANG & FLÄCHENINHALT ZUS. FIGUREN

a) Halbkreis (2 Viertelkreise)

$r = 2 \text{ cm}$
 $u = x \cdot r$
 $u = 2 \cdot r$
 $u = 6,283$
 $\approx \underline{6,28 \text{ cm}}$

$A = x^2 \cdot r : 2$
 $A = 2^2 \cdot r : 2$
 $A = 6,283$
 $\approx \underline{6,28 \text{ cm}^2}$

b) A_1 Halbkreis

$d = 4 \text{ cm}$
 $r = r$
 $u_1 = ?$
 $A_1 = ?$

$x = d : 2$
 $x = 4 : 2$
 $x = \underline{2 \text{ cm}}$

$u_1 = x \cdot r$
 $u_1 = 2 \cdot r$
 $u_1 = 6,283$
 $\approx \underline{6,28 \text{ cm}}$

$A_1 = x^2 \cdot r : 2$
 $A_1 = 2^2 \cdot r : 2$
 $A_1 = 6,283$
 $\approx \underline{6,28 \text{ cm}^2}$

A_2 Kreis

$r = 1 \text{ cm}$
 $u_2 = ?$
 $A_2 = ?$

$u_2 = 2 \cdot x \cdot r$
 $u_2 = 2 \cdot 1 \cdot r$
 $u_2 = 6,283$
 $\approx \underline{6,28 \text{ cm}}$

$A_2 = x^2 \cdot r$
 $A_2 = 1^2 \cdot r$
 $A_2 = 3,141$
 $\approx \underline{3,14 \text{ cm}^2}$

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$A = A_1 - A_2$

$A = 6,28 - 3,14$
 $A = \underline{3,14 \text{ cm}^2}$

$u = u_1 + u_2$
 $u = 6,28 + 6,28$
 $u = \underline{12,56 \text{ cm}}$

c) A_1 Quadrat

$a = 2 \text{ cm}$
 $A_1 = a \cdot a$
 $A_1 = 2 \cdot 2$
 $A_1 = \underline{4 \text{ cm}^2}$

$u = u_2 + 2 + 2$
 $u = 6,28 + 2 + 2$
 $u = \underline{10,28 \text{ cm}}$

$A = A_1 + A_2$

$A = 4 + 3,14$
 $A = \underline{7,14 \text{ cm}^2}$

d) Rechteck A_1

$a = 3 \text{ cm}$
 $b = 1 \text{ cm}$
 $A_1 = ?$

$A_1 = a \cdot b$
 $A_1 = 3 \cdot 1$
 $A_1 = \underline{3 \text{ cm}^2}$

$A = A_1 + A_2$

$A = 3 + 1,57$
 $A = \underline{4,57 \text{ cm}^2}$

$u = 1 + 3 + 3 + 3,14 + 1$

$u = \underline{11,14 \text{ cm}}$

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A_2 2 Halbkreise = 1 Kreis

$r = 1 \text{ cm}$
 $u_2 = 2 \cdot x \cdot r$
 $u_2 = 2 \cdot 1 \cdot r$
 $u_2 = 6,283$
 $\approx \underline{6,28 \text{ cm}}$

$A_2 = x^2 \cdot r$
 $A_2 = 1^2 \cdot r$
 $A_2 = 3,141$
 $\approx \underline{3,14 \text{ cm}^2}$

A_2 Halbkreis

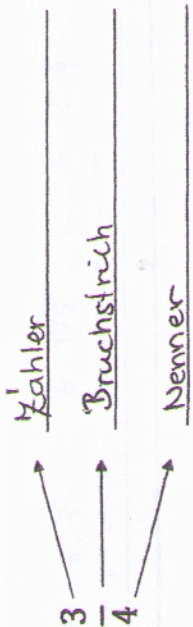
$r = 1 \text{ cm}$
 $u_2 = ?$
 $A_2 = ?$

$u_2 = x \cdot r$
 $u_2 = 1 \cdot r$
 $u_2 = 3,141$
 $\approx \underline{3,14 \text{ cm}}$

$A_2 = x^2 \cdot r : 2$
 $A_2 = 1^2 \cdot r : 2$
 $A_2 = 1,570$
 $\approx \underline{1,57 \text{ cm}^2}$

Brüche benennen und herstellen

1. Beschrifte den Bruch



2. Welcher Bruchteil ist grau dargestellt?

2.1. Stammbrüche

a) $\frac{1}{4}$ b) $\frac{1}{6}$ c) $\frac{1}{8}$ d) $\frac{1}{10}$ e) $\frac{1}{12}$

f) $\frac{1}{4}$ g) $\frac{1}{5}$ h) $\frac{1}{4}$ i) $\frac{1}{7}$ j) $\frac{1}{6}$

2.2. Abgeleitete Brüche

a) $\frac{2}{4}$ b) $\frac{3}{6}$ c) $\frac{5}{8}$ d) $\frac{3}{10}$ e) $\frac{5}{12}$

f) $\frac{3}{10}$ g) $\frac{5}{9}$ h) $\frac{6}{8}$ i) $\frac{4}{6}$ j) $\frac{3}{6}$

3. Stelle den angegebenen Bruchteil dar. Zeichne zuerst die Teile ein und male danach den entsprechenden Teil aus!

3.1. Stammbrüche

a) $\frac{1}{8}$ b) $\frac{1}{6}$ c) $\frac{1}{4}$ d) $\frac{1}{3}$

e) $\frac{1}{4}$ f) $\frac{1}{7}$ g) $\frac{1}{6}$ h) $\frac{1}{9}$

3.2. Abgeleitete Brüche

a) $\frac{3}{4}$ b) $\frac{2}{6}$ c) $\frac{7}{10}$ d) $\frac{3}{5}$

e) $\frac{7}{9}$ f) $\frac{2}{4}$ g) $\frac{3}{8}$ h) $\frac{4}{6}$

Unechte Brüche ↔ Gemischte Zahlen

- S. 4

14)

Wandle in Ganze um!

- a) $\frac{8}{8} = 1$ c) $\frac{30}{6} = 5$ e) $\frac{300}{100} = 3$ g) $\frac{24}{12} = 2$
 b) $\frac{10}{10} = 1$ d) $\frac{15}{3} = 5$ f) $\frac{40}{10} = 4$ h) $\frac{20}{8} = 4$

15)

Wandle in Brüche oder Ganze um!

- a) $3 = \frac{24}{8}$ c) $\frac{45}{5} = 9$ e) $7 = \frac{10}{10}$ g) $\frac{700}{100} = 7$
 b) $\frac{21}{3} = 7$ d) $10 = \frac{120}{12}$ f) $\frac{2}{4} = 13$ h) $9 = \frac{54}{6}$

16)

Wandle in Brüche oder in Ganze um!

- a) $6 = \frac{24}{4}$ c) $\frac{45}{3} = 15$ e) $12 = \frac{1200}{100}$ g) $\frac{34}{2} = 17$
 b) $\frac{72}{9} = 9$ d) $8 = \frac{40}{5}$ f) $\frac{16}{6} = 6$ h) $15 = \frac{60}{4}$

17)

Wandle die Brüche in gemischte Zahlen um!

- a) $\frac{16}{3} = 5 \frac{1}{3}$ b) $\frac{27}{2} = 13 \frac{1}{2}$ c) $\frac{18}{4} = 4 \frac{1}{2}$ d) $\frac{7}{2} = 3 \frac{1}{2}$

18)

Wandle die Brüche in gemischte Zahlen um!

- a) $\frac{55}{10} = 5 \frac{5}{10}$ b) $\frac{11}{4} = 2 \frac{3}{4}$ c) $\frac{25}{8} = 3 \frac{1}{8}$ d) $\frac{26}{6} = 4 \frac{1}{3}$

19)

Wandle die Brüche in gemischte Zahlen um!

- a) $\frac{63}{8} = 7 \frac{7}{8}$ b) $\frac{634}{100} = 6 \frac{34}{100}$ c) $\frac{73}{6} = 12 \frac{1}{6}$ d) $\frac{52}{8} = 6 \frac{2}{8}$

20)

Wandle die Brüche in gemischte Zahlen um!

- a) $\frac{823}{10} = 82 \frac{3}{10}$ b) $\frac{23}{8} = 2 \frac{7}{8}$ c) $\frac{123}{6} = 20 \frac{3}{6}$ d) $\frac{24}{4} = 6$

Unechte Brüche ↔ Gemischte Zahlen

- S. 5

21)

Wandle die gemischten Zahlen in unechte Brüche um!

- a) $3 \frac{1}{6} = \frac{19}{6}$ b) $5 \frac{1}{3} = \frac{16}{3}$ c) $3 \frac{4}{10} = \frac{34}{10}$ d) $7 \frac{3}{5} = \frac{38}{5}$

22)

Wandle die gemischten Zahlen in unechte Brüche um!

- a) $5 \frac{1}{3} = \frac{16}{3}$ b) $7 \frac{7}{10} = \frac{77}{10}$ c) $6 \frac{5}{8} = \frac{53}{8}$ d) $2 \frac{7}{100} = \frac{207}{100}$

23)

Wandle in gemischte Zahlen oder in unechte Brüche um!

- | | | | |
|-----------------------------------|-----------------------------------|--|-----------------------------------|
| a) $4 \frac{3}{5} = \frac{23}{5}$ | b) $5 \frac{5}{8} = \frac{45}{8}$ | c) $\frac{304}{100} = 3 \frac{4}{100}$ | d) $\frac{24}{4} = 5 \frac{3}{4}$ |
|-----------------------------------|-----------------------------------|--|-----------------------------------|

24)

Wandle in gemischte Zahlen oder in unechte Brüche um!

- | | | | |
|-------------------------------------|-----------------------------------|---|-----------------------------------|
| a) $6 \frac{3}{10} = \frac{63}{10}$ | b) $5 \frac{2}{3} = \frac{17}{3}$ | c) $\frac{754}{100} = 7 \frac{54}{100}$ | d) $\frac{33}{6} = 5 \frac{3}{6}$ |
|-------------------------------------|-----------------------------------|---|-----------------------------------|

Brüche erweitern und kürzen

1) Brüche erweitern

a. Erweitere mit 3

$$\frac{3}{4} = \frac{9}{12}$$

$$\frac{8}{9} = \frac{24}{27}$$

$$\frac{2}{3} = \frac{6}{9}$$

$$\frac{3 \cdot 13}{4} = \frac{39}{4}$$

$$\frac{2 \cdot 5}{6} = \frac{10}{30}$$

$$\frac{5 \cdot 6}{8} = \frac{30}{48}$$

$$\frac{2 \cdot 14}{3} = \frac{28}{3}$$

$$\frac{3 \cdot 9}{9} = \frac{27}{9}$$

$$\frac{7 \cdot 10}{10} = \frac{70}{10}$$

b. Mit welcher Zahl muss du erweitern? Vervollständige den erweiterten Bruch.

$$\frac{3 \cdot 3}{4} = \frac{9}{12}$$

$$\frac{2 \cdot 3}{3} = \frac{6}{9}$$

$$\frac{3 \cdot 2}{4} = \frac{6}{8}$$

2) Brüche kürzen

a. Kürze durch 5

$$\frac{5}{10} = \frac{1}{2}$$

$$\frac{15}{25} = \frac{3}{5}$$

$$\frac{20}{35} = \frac{4}{7}$$

b. Mit welcher Zahl wurde gekürzt? Vervollständige den gekürzten Bruch

$$\frac{20 \cdot 10}{30} = \frac{200}{30}$$

$$\frac{21 \cdot 14}{49} = \frac{294}{49}$$

$$\frac{16 \cdot 14}{20} = \frac{224}{20}$$

c. Kürze soweit wie möglich

$$\frac{8}{12} = \frac{2}{3}$$

$$\frac{14}{28} = \frac{1}{2}$$

$$\frac{35}{50} = \frac{7}{10}$$

$$\frac{16}{20} = \frac{4}{5}$$

$$\frac{20}{25} = \frac{4}{5}$$

$$\frac{10}{100} = \frac{1}{10}$$

$$\frac{12}{15} = \frac{4}{5}$$

$$\frac{10}{15} = \frac{2}{3}$$

$$\frac{3}{9} = \frac{1}{3}$$

$$\frac{6}{16} = \frac{3}{8}$$

$$\frac{24}{100} = \frac{6}{25}$$

$$\frac{36}{50} = \frac{18}{25}$$

ADDITION UND SUBTRAKTION GLEICHNAMIGER BRÜCHE

$$\frac{3}{4} + \frac{3}{5} = \frac{15}{20} + \frac{12}{20} = \frac{27}{20}$$

$$2\frac{3}{4} - 1\frac{1}{4} = \frac{11}{4} - \frac{1}{4} = \frac{10}{4} = \frac{5}{2}$$

$$3 + \frac{7}{9} = \frac{27}{9} + \frac{7}{9} = \frac{34}{9}$$

$$4 - \frac{7}{8} = \frac{32}{8} - \frac{7}{8} = \frac{25}{8}$$

$$\frac{3}{4} + \frac{3}{4} = \frac{6}{4} = \frac{3}{2} = 1\frac{1}{2}$$

$$3\frac{7}{8} - 2\frac{1}{8} = \frac{31}{8} - \frac{1}{8} = \frac{30}{8} = \frac{15}{4} = 3\frac{3}{4}$$

$$\frac{5}{6} + \frac{5}{6} = \frac{10}{6} = \frac{5}{3} = 1\frac{2}{3}$$

$$\frac{5}{6} - \frac{1}{6} = \frac{4}{6} = \frac{2}{3}$$

$$1\frac{2}{3} - \frac{1}{3} = \frac{5}{3} - \frac{1}{3} = \frac{4}{3} = 1\frac{1}{3}$$

$$\frac{3}{2} + \frac{1}{2} = \frac{4}{2} = 2$$

$$3\frac{1}{4} - 1\frac{3}{4} = \frac{13}{4} - \frac{5}{4} = \frac{8}{4} = 2$$

$$\frac{7}{8} + \frac{5}{8} = \frac{12}{8} = \frac{3}{2} = 1\frac{1}{2}$$

$$1\frac{3}{4} + 1\frac{3}{4} = \frac{7}{4} + \frac{7}{4} = \frac{14}{4} = \frac{7}{2} = 3\frac{1}{2}$$

$$\frac{5}{4} - \frac{1}{4} = \frac{4}{4} = 1$$

$$3\frac{3}{8} - \frac{7}{8} = \frac{27}{8} - \frac{7}{8} = \frac{20}{8} = \frac{5}{2} = 2\frac{1}{2}$$

$$1\frac{1}{2} + 1\frac{1}{2} = \frac{3}{2} + \frac{3}{2} = \frac{6}{2} = 3$$

$$3\frac{1}{4} - \frac{3}{4} = \frac{13}{4} - \frac{3}{4} = \frac{10}{4} = \frac{5}{2} = 2\frac{1}{2}$$

$$2\frac{2}{6} - \frac{5}{6} = \frac{14}{6} - \frac{5}{6} = \frac{9}{6} = \frac{3}{2} = 1\frac{1}{2}$$

$$2 - \frac{3}{8} = \frac{16}{8} - \frac{3}{8} = \frac{13}{8} = 1\frac{5}{8}$$

$$2\frac{7}{8} - 2\frac{1}{8} = \frac{23}{8} - \frac{1}{8} = \frac{22}{8} = \frac{11}{4}$$

$$\frac{3}{5} + \frac{3}{5} = \frac{6}{5}$$

$$2\frac{3}{4} - 1\frac{1}{4} = \frac{5}{4} = 1\frac{1}{4}$$

$$3 + \frac{7}{9} = \frac{27}{9} + \frac{7}{9} = \frac{34}{9}$$

$$4 - \frac{7}{8} = \frac{32}{8} - \frac{7}{8} = \frac{25}{8}$$

$$\frac{3}{4} + \frac{3}{4} = \frac{6}{4} = \frac{3}{2} = 1\frac{1}{2}$$

$$3\frac{7}{8} - 2\frac{1}{8} = \frac{31}{8} - \frac{1}{8} = \frac{30}{8} = \frac{15}{4}$$

$$\frac{5}{6} + \frac{5}{6} = \frac{10}{6} = \frac{5}{3} = 1\frac{2}{3}$$

$$\frac{5}{6} - \frac{1}{6} = \frac{4}{6} = \frac{2}{3}$$

$$1\frac{2}{3} - \frac{1}{3} = \frac{5}{3} - \frac{1}{3} = \frac{4}{3} = 1\frac{1}{3}$$

$$\frac{3}{2} + \frac{1}{2} = \frac{4}{2} = 2$$

$$3\frac{1}{4} - 1\frac{3}{4} = \frac{13}{4} - \frac{5}{4} = \frac{8}{4} = 2$$

$$\frac{7}{8} + \frac{5}{8} = \frac{12}{8} = \frac{3}{2} = 1\frac{1}{2}$$

$$1\frac{2}{4} + 1\frac{2}{4} = \frac{5}{2} + \frac{5}{2} = \frac{10}{2} = 5$$

$$\frac{5}{4} - \frac{1}{4} = \frac{4}{4} = 1$$

$$3\frac{3}{8} - \frac{7}{8} = \frac{27}{8} - \frac{7}{8} = \frac{20}{8} = \frac{5}{2} = 2\frac{1}{2}$$

$$1\frac{1}{2} + 1\frac{1}{2} = \frac{3}{2} + \frac{3}{2} = \frac{6}{2} = 3$$

$$3\frac{1}{4} - \frac{3}{4} = \frac{13}{4} - \frac{3}{4} = \frac{10}{4} = \frac{5}{2} = 2\frac{1}{2}$$

$$2\frac{2}{6} - \frac{5}{6} = \frac{11}{6} - \frac{5}{6} = \frac{6}{6} = 1$$

$$2 - \frac{3}{8} = \frac{16}{8} - \frac{3}{8} = \frac{13}{8} = 1\frac{5}{8}$$

$$2\frac{7}{8} - 2\frac{1}{8} = \frac{23}{8} - \frac{1}{8} = \frac{22}{8} = \frac{11}{4}$$

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