

SIGMABUDGIE · GRADE 4

Fractions

A gentle walkthrough & a 24-question exam

Part 1 walks through equivalent fractions, comparing, adding, and fractions of a number from the very beginning, with drawings. Part 2 is a 24-question exam that starts easy and slowly builds to harder, ISEE-style reasoning questions. Work through the lesson together first, then let your child try the exam. The answer key at the back explains every question.

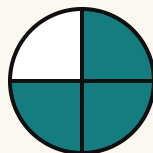
1 · What the two numbers mean

The **bottom** (denominator) says how many equal parts make one whole. The **top** (numerator) says how many you have. **3/4**: 4 equal parts, 3 shaded.

The same fraction can be a shape, a set, or a point on a number line.



3/4 of a bar



3/4 of a circle

2 · Equivalent fractions

Cut every piece of $1/2$ in two and you get $2/4$. Same amount, new name: **$1/2 = 2/4 = 4/8$** .

Multiply top and bottom by the **same** number and the fraction does not change: $2/3 = 4/6 = 6/9$.



$1/2 = 2/4$

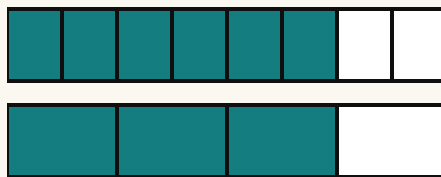


$2/3 = 4/6$

3 · Simplest form

Go the other way: divide top and bottom by the same number. **$6/8 \div 2 = 3/4$** . When nothing divides both, the fraction is in **simplest form**.

$4/12$: both divide by 4, so $4/12 = 1/3$.

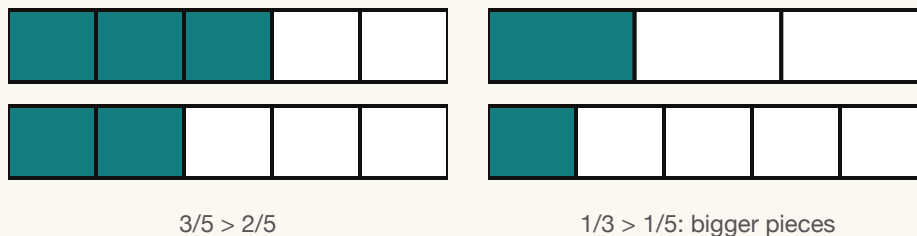


$6/8 = 3/4$

4 • Comparing: same bottom, same top

Same bottom: more pieces wins. $\frac{3}{5} > \frac{2}{5}$.

Same top: the smaller bottom wins, because the pieces are bigger. $\frac{1}{3} > \frac{1}{5}$.



5 • Comparing: different bottoms

$\frac{2}{3}$ or $\frac{3}{4}$? Rename both to twelfths: $\frac{2}{3} = \frac{8}{12}$ and $\frac{3}{4} = \frac{9}{12}$. So **$\frac{3}{4}$ is greater**.

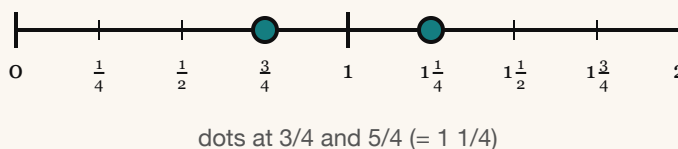
Shortcut: compare to a half. $\frac{2}{3}$ is a half plus $\frac{1}{6}$; $\frac{3}{4}$ is a half plus $\frac{1}{4}$. A quarter is bigger than a sixth, so $\frac{3}{4}$ wins.



6 • Fractions on the number line

Split the space between 0 and 1 into equal steps. On a line marked in fourths, the dot at the third mark is $\frac{3}{4}$.

Past 1 the counting keeps going: $\frac{5}{4}$ is one whole and one more quarter, which is **$1\frac{1}{4}$** .



7 • Adding and subtracting, same bottom

Same bottom? Add or subtract the **tops** and keep the bottom. $3/6 - 1/6 = 2/6$, which simplifies to $1/3$.

$2/5 + 2/5 = 4/5$. $3/5 - 2/5 = 1/5$. Never add the bottoms.



$3/6$



$3/6 - 1/6 = 2/6 = 1/3$

8 • Making a whole

All the parts together make 1: $4/4 = 1$, $6/6 = 1$. So $1 - 1/4 = 3/4$: take one quarter away from four quarters.

$2/5 + ? = 1$: you need 3 more fifths. $? = 3/5$.

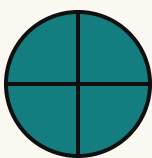


$1 - 1/4 = 3/4$

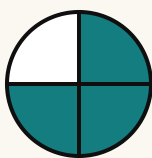
9 • Mixed numbers and improper fractions

$7/4$ is more than 1: four quarters make a whole, and 3 are left. So $7/4 = 1 \frac{3}{4}$, a **mixed number**.

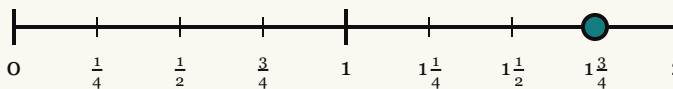
Back the other way: $2 \frac{1}{3} = 2$ wholes ($6/3$) plus $1/3 = 7/3$.



$4/4 = 1$



$+ 3/4$

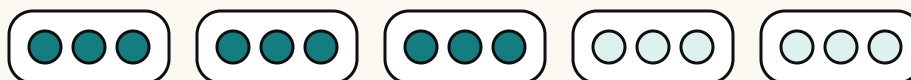


$7/4 = 1 \frac{3}{4}$ on the line

10 • A fraction of a number

$3/5$ of 75: split 75 into 5 equal parts ($75 \div 5 = 15$), then take 3 of them ($3 \times 15 = 45$). The picture shows the same idea with 15: 5 parts of 3, take 3 parts, that is 9.

Divide by the bottom, multiply by the top. $1/4$ of 32 = 8. $2/3$ of 27 = 18.



5 equal parts of 15, take 3 of them: 9

11 • Working backwards

4/5 of a number is 24. What is the number? If 4 parts are 24, one part is $24 \div 4 = 6$. The whole is 5 parts: $5 \times 6 = \mathbf{30}$.

Divide by the top to find one part, then multiply by the bottom.

12 • Fractions in stories

"A group has 75 students. $3/5$ are chosen. How many?" $75 \div 5 = 15$, $3 \times 15 = \mathbf{45}$.

"Mia ate $2/8$ of a pizza and Leo ate $3/8$. How much is left?" $2/8 + 3/8 = 5/8$ eaten, so $8/8 - 5/8 = \mathbf{3/8}$ left.
You are ready for the test! 🎉

Read each drawing first, then choose the best answer. Take your time, there is no clock here. Questions start gentle and get harder toward the end. Circle your answer.

- 1 What fraction of the bar is shaded?



- A $\frac{3}{4}$ B $\frac{1}{4}$
C $\frac{4}{3}$ D $\frac{3}{3}$

- 2 Which fraction is the same as $\frac{1}{2}$?



- A $\frac{1}{4}$ B $\frac{2}{3}$
C $\frac{2}{4}$ D $\frac{1}{3}$

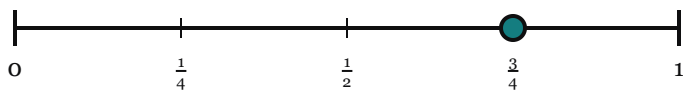
- 3 $\frac{3}{5} - \frac{2}{5} = ?$

- A $\frac{1}{0}$ B $\frac{5}{5}$
C $\frac{1}{10}$ D $\frac{1}{5}$

- 4 Which is greater: $\frac{3}{5}$ or $\frac{2}{5}$?

- A $\frac{2}{5}$ B $\frac{3}{5}$
C They are equal D You cannot tell

- 5 What fraction is the dot on?



- A $\frac{1}{4}$ B $\frac{3}{3}$
C $\frac{3}{4}$ D $\frac{4}{3}$

6 What is $\frac{1}{4}$ of 32?

A 8

B 4

C 16

D 28

7 $\frac{3}{6} - \frac{1}{6} = ?$

A $\frac{2}{0}$

B $\frac{1}{3}$

C $\frac{2}{12}$

D $\frac{4}{6}$

8 Which is greater: $\frac{1}{3}$ or $\frac{1}{5}$?

A $\frac{1}{5}$

B They are equal

C You cannot tell

D $\frac{1}{3}$

9 What is $\frac{6}{8}$ in simplest form?

A $\frac{3}{4}$

B $\frac{2}{4}$

C $\frac{6}{8}$

D $\frac{1}{2}$

10 $\frac{2}{5} + \frac{2}{5} = ?$

A $\frac{4}{10}$

B $\frac{2}{10}$

C $\frac{4}{5}$

D 1

11 What is $\frac{2}{3}$ of 27?

A 9

B 24

C 6

D 18

12 Which is greater: $\frac{2}{3}$ or $\frac{3}{4}$?



A $\frac{2}{3}$

B $\frac{3}{4}$

C They are equal

D You cannot tell

13 $1 - 1/4 = ?$

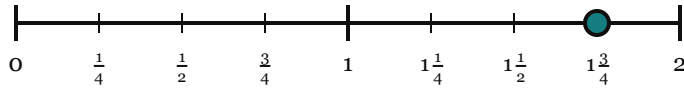
A $1/4$

B 0

C $3/4$

D $4/4$

14 Which mixed number is the same as $7/4$?



A $1\frac{3}{4}$

B $1\frac{1}{4}$

C $2\frac{1}{4}$

D $7\frac{1}{4}$

15 A group has 75 students. $3/5$ of them are chosen. How many students are chosen?

A 15

B 45

C 25

D 60

16 Which fraction is NOT equal to $2/3$?

A $4/6$

B $6/9$

C $8/12$

D $3/4$

17 $4/5$ of a number is 24. What is the number?

A 20

B 6

C 96

D 30

18 Which shows the fractions in order from least to greatest?

A $1/2, 1/4, 1/6$

B $1/6, 1/4, 1/2$

C $1/4, 1/6, 1/2$

D $1/6, 1/2, 1/4$

19 What is $2\frac{1}{3}$ as an improper fraction?

A $7/3$

B $5/3$

C $6/3$

D $2/3$

20 Mia ate $\frac{2}{8}$ of a pizza and Leo ate $\frac{3}{8}$. What fraction of the pizza is left?

A $\frac{5}{8}$

B $\frac{1}{8}$

C $\frac{3}{8}$

D $\frac{5}{16}$

21 $\frac{2}{5} + ? = 1$. What is the missing fraction?

A $\frac{2}{5}$

B $\frac{3}{5}$

C $\frac{1}{5}$

D $\frac{5}{5}$

22 $\frac{3}{4}$ of a number is 36. What is $\frac{1}{4}$ of that number?

A 48

B 9

C 27

D 12

23 Which is closest to $\frac{1}{2}$?

A $\frac{1}{5}$

B $\frac{7}{8}$

C $\frac{4}{9}$

D $\frac{1}{10}$

24 Ben had 40 marbles. He gave $\frac{1}{4}$ to Sam and $\frac{2}{5}$ to Kim. How many marbles does Ben have left?

A 14

B 26

C 10

D 16

ANSWER KEY & EXPLANATIONS

- 1 A** 4 equal parts, 3 shaded.
-
- 2 C** Both bars shade the same amount: $1/2 = 2/4$.
-
- 3 D** Same bottom: subtract the tops. $3 - 2 = 1$, so $1/5$.
-
- 4 B** Same bottom, so more pieces wins: $3/5$.
-
- 5 C** The line is in fourths and the dot is on the third mark.
-
- 6 A** $32 \div 4 = 8$.
-
- 7 B** $3/6 - 1/6 = 2/6$, which simplifies to $1/3$.
-
- 8 D** Same top: the smaller bottom has bigger pieces. Thirds are bigger than fifths.
-
- 9 A** Divide top and bottom by 2: $3/4$.
-
- 10 C** Same bottom: add the tops. $4/5$.
-
- 11 D** $27 \div 3 = 9$, then $2 \times 9 = 18$.
-
- 12 B** $2/3 = 8/12$ and $3/4 = 9/12$. 9 twelfths is more.
-
- 13 C** One whole is $4/4$. Take away $1/4$ and $3/4$ is left.
-
- 14 A** Four quarters make 1, and 3 quarters are left: $1 \frac{3}{4}$.
-
- 15 B** $75 \div 5 = 15$, then $3 \times 15 = 45$.
-
- 16 D** $4/6$, $6/9$, and $8/12$ all simplify to $2/3$. $3/4$ does not.
-
- 17 D** One fifth is $24 \div 4 = 6$. The whole is $5 \times 6 = 30$.
-
- 18 B** Same top: bigger bottom means smaller pieces. $1/6 < 1/4 < 1/2$.
-
- 19 A** 2 wholes = $6/3$. Plus $1/3 = 7/3$.
-
- 20 C** $2/8 + 3/8 = 5/8$ eaten. $8/8 - 5/8 = 3/8$ left.
-
- 21 B** $1 = 5/5$. $5/5 - 2/5 = 3/5$.
-
- 22 D** If 3 quarters are 36, one quarter is $36 \div 3 = 12$.
-
- 23 C** $4/9$ is just under $4.5/9$, which is one half. The others are far from a half.
-
- 24 A** $1/4$ of 40 = 10 and $2/5$ of 40 = 16. $40 - 10 - 16 = 14$.
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