

Name _____

Date _____

7.1 Fractions and equivalence — worked answers

Recognise equivalent fractions, simplify, compare and order fractions, and convert between improper fractions and mixed numbers. · 75 questions

A · Fluency — Simplify, compare and convert.

- 1 Write $\frac{1}{2}$ in its simplest form.

Answer: $\frac{1}{2}$

The highest common factor of 2 and 4 is 2, so divide both by 2: $2 \div 2 = 1$ and $4 \div 2 = 2$.

- 2 Write $\frac{1}{3}$ in its simplest form.

Answer: $\frac{1}{3}$

The highest common factor of 3 and 9 is 3, so divide both by 3: $3 \div 3 = 1$ and $9 \div 3 = 3$.

- 3 Write $\frac{3}{4}$ in its simplest form.

Answer: $\frac{3}{4}$

The highest common factor of 6 and 8 is 2, so divide both by 2: $6 \div 2 = 3$ and $8 \div 2 = 4$.

- 4 Write $\frac{2}{3}$ in its simplest form.

Answer: $\frac{2}{3}$

The highest common factor of 10 and 15 is 5, so divide both by 5: $10 \div 5 = 2$ and $15 \div 5 = 3$.

- 5 Write $\frac{2}{3}$ in its simplest form.

Answer: $\frac{2}{3}$

The highest common factor of 12 and 18 is 6, so divide both by 6: $12 \div 6 = 2$ and $18 \div 6 = 3$.

- 6 Write $\frac{2}{3}$ in its simplest form.

Answer: $\frac{2}{3}$

The highest common factor of 14 and 21 is 7, so divide both by 7: $14 \div 7 = 2$ and $21 \div 7 = 3$.

- 7 Write $\frac{2}{3}$ in its simplest form.

Answer: $\frac{2}{3}$

The highest common factor of 8 and 12 is 4, so divide both by 4: $8 \div 4 = 2$ and $12 \div 4 = 3$.

- 8 Write $\frac{3}{5}$ in its simplest form.

Answer: $\frac{3}{5}$

The highest common factor of 15 and 25 is 5, so divide both by 5: $15 \div 5 = 3$ and $25 \div 5 = 5$.

- 9 Write $\frac{3}{4}$ in its simplest form.

Answer: $\frac{3}{4}$

The highest common factor of 18 and 24 is 6, so divide both by 6: $18 \div 6 = 3$ and $24 \div 6 = 4$.

- 10** Write $\frac{4}{9}$ in its simplest form.

Answer: 4/9

The highest common factor of 20 and 45 is 5, so divide both by 5: $20 \div 5 = 4$ and $45 \div 5 = 9$.

- 11** Write $\frac{3}{10}$ in its simplest form.

Answer: 3/10

The highest common factor of 9 and 30 is 3, so divide both by 3: $9 \div 3 = 3$ and $30 \div 3 = 10$.

- 12** Write $\frac{2}{5}$ in its simplest form.

Answer: 2/5

The highest common factor of 16 and 40 is 8, so divide both by 8: $16 \div 8 = 2$ and $40 \div 8 = 5$.

- 13** Which fraction is larger, $\frac{1}{2}$ or $\frac{3}{4}$?

☐ $\frac{1}{2}$

☐ $\frac{3}{4}$

Answer: 3/4

Write both over 4: $\frac{1}{2} = \frac{2}{4}$ and $\frac{3}{4} = \frac{3}{4}$. Compare the numerators.

- 14** Which fraction is larger, $\frac{2}{3}$ or $\frac{3}{5}$?

☐ $\frac{2}{3}$

☐ $\frac{3}{5}$

Answer: 2/3

Write both over 15: $\frac{2}{3} = \frac{10}{15}$ and $\frac{3}{5} = \frac{9}{15}$. Compare the numerators.

- 15** Which fraction is larger, $\frac{5}{8}$ or $\frac{7}{12}$?

☐ $\frac{5}{8}$

☐ $\frac{7}{12}$

Answer: 5/8

Write both over 24: $\frac{5}{8} = \frac{15}{24}$ and $\frac{7}{12} = \frac{14}{24}$. Compare the numerators.

- 16** Which fraction is larger, $\frac{3}{4}$ or $\frac{5}{6}$?

☐ $\frac{3}{4}$

☐ $\frac{5}{6}$

Answer: 5/6

Write both over 12: $\frac{3}{4} = \frac{9}{12}$ and $\frac{5}{6} = \frac{10}{12}$. Compare the numerators.

- 17** Which fraction is larger, $\frac{2}{5}$ or $\frac{3}{8}$?

☐ $\frac{2}{5}$

☐ $\frac{3}{8}$

Answer: 2/5

Write both over 40: $\frac{2}{5} = \frac{16}{40}$ and $\frac{3}{8} = \frac{15}{40}$. Compare the numerators.

- 18** Which fraction is larger, $\frac{7}{10}$ or $\frac{2}{3}$?

☐ $\frac{7}{10}$

☐ $\frac{2}{3}$

Answer: 7/10

Write both over 30: $\frac{7}{10} = \frac{21}{30}$ and $\frac{2}{3} = \frac{13}{30}$. Compare the numerators.

- 19** Which fraction is larger, $\frac{4}{9}$ or $\frac{1}{2}$?

☐ $\frac{4}{9}$

☐ $\frac{1}{2}$

Answer: 1/2

Write both over 18: $\frac{4}{9} = \frac{8}{18}$ and $\frac{1}{2} = \frac{9}{18}$. Compare the numerators.

- 20 Which fraction is larger, $\frac{5}{6}$ or $\frac{7}{9}$?

☐ $\frac{5}{6}$

☐ $\frac{7}{9}$

Answer: 5/6

Write both over 18: $\frac{5}{6} = \frac{15}{18}$ and $\frac{7}{9} = \frac{14}{18}$. Compare the numerators.

- 21 Write $\frac{7}{4}$ as a mixed number.

Answer: 1 $\frac{3}{4}$

$7 \div 4 = 1$ remainder 3, so it is 1 and $\frac{3}{4}$.

- 22 Write $\frac{9}{2}$ as a mixed number.

Answer: 4 $\frac{1}{2}$

$9 \div 2 = 4$ remainder 1, so it is 4 and $\frac{1}{2}$.

- 23 Write $\frac{11}{3}$ as a mixed number.

Answer: 3 $\frac{2}{3}$

$11 \div 3 = 3$ remainder 2, so it is 3 and $\frac{2}{3}$.

- 24 Write $\frac{17}{5}$ as a mixed number.

Answer: 3 $\frac{2}{5}$

$17 \div 5 = 3$ remainder 2, so it is 3 and $\frac{2}{5}$.

- 25 Write $\frac{13}{6}$ as a mixed number.

Answer: 2 $\frac{1}{6}$

$13 \div 6 = 2$ remainder 1, so it is 2 and $\frac{1}{6}$.

- 26 Write $\frac{23}{8}$ as a mixed number.

Answer: 2 $\frac{7}{8}$

$23 \div 8 = 2$ remainder 7, so it is 2 and $\frac{7}{8}$.

- 27 Write $\frac{19}{4}$ as a mixed number.

Answer: 4 $\frac{3}{4}$

$19 \div 4 = 4$ remainder 3, so it is 4 and $\frac{3}{4}$.

- 28 Write $\frac{25}{7}$ as a mixed number.

Answer: 3 $\frac{4}{7}$

$25 \div 7 = 3$ remainder 4, so it is 3 and $\frac{4}{7}$.

- 29 Write $2\frac{1}{3}$ as an improper fraction.

Answer: $\frac{7}{3}$

2 whole ones are $2 \times 3 = 6$ parts, plus 1 more parts: $\frac{7}{3}$.

- 30 Write $1\frac{3}{4}$ as an improper fraction.

Answer: $\frac{7}{4}$

1 whole ones are $1 \times 4 = 4$ parts, plus 3 more parts: $\frac{7}{4}$.

- 31 Write $3\frac{2}{5}$ as an improper fraction.

Answer: $\frac{17}{5}$

3 whole ones are $3 \times 5 = 15$ parts, plus 2 more parts: $\frac{17}{5}$.

- 32 Write $4\frac{1}{2}$ as an improper fraction.

Answer: $\frac{9}{2}$

4 whole ones are $4 \times 2 = 8$ parts, plus 1 more parts: $\frac{9}{2}$.

- 33 Write $2\frac{5}{6}$ as an improper fraction.

Answer: $\frac{17}{6}$

2 whole ones are $2 \times 6 = 12$ parts, plus 5 more parts: $\frac{17}{6}$.

- 34 Write $5\frac{3}{8}$ as an improper fraction.

Answer: $\frac{43}{8}$

5 whole ones are $5 \times 8 = 40$ parts, plus 3 more parts: $\frac{43}{8}$.

- 35 Write $1\frac{7}{10}$ as an improper fraction.

Answer: $\frac{17}{10}$

1 whole ones are $1 \times 10 = 10$ parts, plus 7 more parts: $\frac{17}{10}$.

- 36 Write $3\frac{4}{9}$ as an improper fraction.

Answer: $\frac{31}{9}$

3 whole ones are $3 \times 9 = 27$ parts, plus 4 more parts: $\frac{31}{9}$.

- 37 Write $\frac{1}{2}$ as a decimal.

Answer: 0.5

$1 \div 2 = 0.5$.

- 38 Write $\frac{1}{4}$ as a decimal.

Answer: 0.25

$1 \div 4 = 0.25$.

- 39 Write $\frac{3}{4}$ as a decimal.

Answer: 0.75

$3 \div 4 = 0.75$.

- 40 Write $\frac{1}{5}$ as a decimal.

Answer: 0.2

$1 \div 5 = 0.2$.

- 41 Write $\frac{2}{5}$ as a decimal.

Answer: 0.4

$2 \div 5 = 0.4$.

- 42 Write $\frac{1}{10}$ as a decimal.

Answer: 0.1

$1 \div 10 = 0.1$.

- 43 Write $\frac{3}{10}$ as a decimal.

Answer: 0.3

$3 \div 10 = 0.3$.

- 44 Write $\frac{1}{8}$ as a decimal.

Answer: 0.125

$1 \div 8 = 0.125$.

- 45 Write $\frac{7}{10}$ as a decimal.

Answer: 0.7

$7 \div 10 = 0.7$.

- 46 Write 3_5 as a decimal.

Answer: 0.6

$$3 \div 5 = 0.6.$$

B · Reasoning — Why the rules are what they are.

- 47 What does the denominator of a fraction tell you?

- ☐ How many parts you have
- ☐ How many equal parts the whole is split into
- ☐ The size of the whole
- ☐ Nothing

Answer: How many equal parts the whole is split into

The numerator, on top, says how many of those parts you have.

- 48 Two fractions are equivalent when ...

- ☐ they look similar
- ☐ they have the same value
- ☐ they have the same numerator
- ☐ they have the same denominator

Answer: they have the same value

$\frac{2}{4}$ and $\frac{1}{2}$ are equivalent — the same amount written two ways.

- 49 How do you make an equivalent fraction?

- ☐ Add the same number to top and bottom
- ☐ Multiply or divide top and bottom by the same number
- ☐ Multiply the top only
- ☐ Swap the top and bottom

Answer: Multiply or divide top and bottom by the same number

Adding changes the value; multiplying both parts does not.

- 50 A fraction is in its simplest form when ...

- ☐ the numerator is 1
- ☐ the numerator and denominator have no common factor except 1
- ☐ the denominator is even
- ☐ it is less than 1

Answer: the numerator and denominator have no common factor except 1

Divide by the HCF once and you are there in a single step.

- 51 To compare $\frac{2}{3}$ and $\frac{3}{5}$, what is the first step?

- ☐ Add them
- ☐ Write them with the same denominator
- ☐ Turn them into mixed numbers
- ☐ Compare the numerators as they are

Answer: Write them with the same denominator

A common denominator of 15 gives $\frac{10}{15}$ and $\frac{9}{15}$.

- 52 Is $\frac{7}{4}$ an improper fraction?

- ☐ Yes
- ☐ No

Answer: Yes

Its numerator is bigger than its denominator, so it is more than 1.

53 Is $5/5$ equal to 1?

- ☐ Yes
☐ No

Answer: Yes

Five fifths make one whole.

54 Does multiplying the numerator only change the value of a fraction?

- ☐ Yes
☐ No

Answer: Yes

It does change the value — only multiplying **both** parts keeps it the same.

55 Which is the best common denominator for $1/4$ and $1/6$?

- ☐ 24
☐ 12
☐ 10
☐ 4

Answer: 12

12 is the lowest common multiple of 4 and 6. Larger ones work but leave more simplifying to do.

56 Zara says $3/8$ is bigger than $1/2$ because 3 is bigger than 1. What has she missed?

- ☐ Nothing
☐ The denominators are different, so the parts are different sizes
☐ $3/8$ is not a fraction
☐ $1/2$ is a decimal

Answer: The denominators are different, so the parts are different sizes

Over 8: $3/8$ against $4/8$. So $3/8$ is smaller.

57 How many eighths make one half?

Answer: 4

$1/2 = 4/8$.

58 How many twelfths make three quarters?

Answer: 9

$3/4 = 9/12$.

C · Challenge — Fractions between fractions.

59 Write a fraction exactly halfway between $\frac{1}{4}$ and $\frac{1}{2}$.

Answer: $3/8$

Over 8 they are $2/8$ and $4/8$, so halfway is $3/8$.

60 Write a fraction exactly halfway between $\frac{1}{3}$ and $\frac{1}{2}$.

Answer: $5/12$

Over 12 they are $4/12$ and $6/12$, so halfway is $5/12$.

61 A fraction equivalent to $3/5$ has a denominator of 40. What is its numerator?

Answer: 24

$40 \div 5 = 8$, and $3 \times 8 = 24$.

- 62** A fraction equivalent to $\frac{7}{9}$ has a numerator of 35. What is its denominator?

Answer: 45

$35 \div 7 = 5$, and $9 \times 5 = 45$.

- 63** How many fractions with denominator 12 lie strictly between $\frac{1}{4}$ and $\frac{3}{4}$?

Answer: 5

$\frac{1}{4} = \frac{3}{12}$ and $\frac{3}{4} = \frac{9}{12}$, so $\frac{4}{12}$ to $\frac{8}{12}$ — that is 5 fractions.

- 64** Which is larger, $\frac{5}{8}$ or $\frac{7}{12}$? Give the larger one.

Answer: $\frac{5}{8}$

Over 24: $\frac{15}{24}$ against $\frac{14}{24}$, so $\frac{5}{8}$ is larger.

- 65** Write 0.35 as a fraction in its simplest form. Give the denominator.

Answer: 20

$0.35 = \frac{35}{100} = \frac{7}{20}$ after dividing both by 5.

D · Word problems — Fractions of real quantities.

- 66** A pizza is cut into 8 equal slices and 6 are eaten. What fraction is eaten, in its simplest form?

Answer: $\frac{3}{4}$

$\frac{6}{8} = \frac{3}{4}$ after dividing both by 2.

- 67** 18 of the 24 learners in a class walk to school. What fraction is that, simplified?

Answer: $\frac{3}{4}$

The HCF of 18 and 24 is 6, giving $\frac{3}{4}$.

- 68** A jug holds 500 ml and 200 ml is poured out. What fraction is poured out, simplified?

Answer: $\frac{2}{5}$

$\frac{200}{500} = \frac{2}{5}$ after dividing both by 100.

- 69** A book has 90 pages and 30 have been read. What fraction is read, simplified?

Answer: $\frac{1}{3}$

$\frac{30}{90} = \frac{1}{3}$.

- 70** Two thirds of 45 learners came by bus. How many is that?

Answer: 30

$45 \div 3 = 15$, and $15 \times 2 = 30$.

- 71** Three quarters of a 60-minute lesson has gone. How many minutes is that?

Answer: 45

$60 \div 4 = 15$, and $15 \times 3 = 45$.

- 72** Five eighths of 32 seats are taken. How many seats is that?

Answer: 20

$32 \div 8 = 4$, and $4 \times 5 = 20$.

- 73** In a bag of 20 sweets, 12 are red. What fraction are red, simplified?

Answer: $\frac{3}{5}$

$\frac{12}{20} = \frac{3}{5}$.

- 74** A recipe uses $\frac{3}{4}$ of a 400 g bag of flour. How many grams is that?

Answer: 300

$400 \div 4 = 100$, and $100 \times 3 = 300$.

75 Two fifths of a 350 km journey is done. How many kilometres is that?

Answer: 140

$350 \div 5 = 70$, and $70 \times 2 = 140$.