

Fractions: Adding & Subtracting

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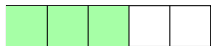
Questions and short answers

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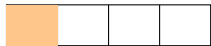
Worked solutions

- ▶ Starter 1
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Starter 1



$\frac{1}{2}$



$\frac{1}{4}$

1. Fully simplify: $\frac{12}{16}$

2. Which is larger: $\frac{3}{7}$ or $\frac{3}{9}$?

3. Convert $\frac{11}{4}$ to a mixed number.

4. Complete the addition represented by the bars to the left:

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

5. Calculate:

$$\frac{1}{7} + \frac{3}{7}$$

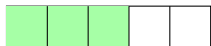
$$\frac{5}{9} + \frac{2}{9}$$

6. To add $\frac{1}{2} + \frac{1}{4}$, what must you do first? Can you draw a picture to demonstrate?

7. Calculate: $\frac{1}{5} + \frac{1}{5}$

8. Calculate: $\frac{1}{5} + \frac{1}{5}$

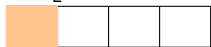
Starter 1



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



$$\frac{1}{2}$$



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



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

1. Fully simplify: $\frac{12}{16} = \frac{3}{4}$
2. Which is larger: $\frac{3}{7}$ or $\frac{3}{9}$? $\frac{3}{7}$
3. Convert $\frac{11}{4}$ to a mixed number. $= 2\frac{3}{4}$
4. Complete the addition represented by the bars to the left:

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

5. Calculate:

$$\frac{1}{7} + \frac{3}{7}$$

$$\frac{5}{9} + \frac{2}{9}$$

$$= \frac{4}{7}, \frac{7}{9}$$

6. To add $\frac{1}{2} + \frac{1}{4}$, what must you do first? Can you draw a picture to demonstrate? Find a common denominator: $\frac{1}{2} = \frac{2}{4}$, so $\frac{2}{4} + \frac{1}{4} = \frac{3}{4}$.

$$7. \text{ Calculate: } \frac{1}{2} + \frac{1}{2} = \frac{3}{2}$$

$$8. \text{ Calculate: } \frac{1}{2} + \frac{1}{2} = \frac{7}{10}$$



Worked Solution: Starter 1, Question 1

Question: Fully simplify $\frac{12}{16}$.

Worked Solution:

Worked Solution: Starter 1, Question 1

Question: Fully simplify $\frac{12}{16}$.

Worked Solution: Divide the numerator and denominator by their HCF, 4: $\frac{12}{16} = \frac{12 \div 4}{16 \div 4} = \frac{3}{4}$.

Worked Solution: Starter 1, Question 2

Question: Which is larger: $\frac{3}{7}$ or $\frac{3}{9}$?

Worked Solution:

Worked Solution: Starter 1, Question 2

Question: Which is larger: $\frac{3}{7}$ or $\frac{3}{9}$?

Worked Solution: Same numerator, smaller denominator gives the larger fraction: $\frac{3}{7} > \frac{3}{9}$, so $\frac{3}{7}$ is larger.

Worked Solution: Starter 1, Question 3

Question: Convert $\frac{11}{4}$ to a mixed number.

Worked Solution:

Worked Solution: Starter 1, Question 3

Question: Convert $\frac{11}{4}$ to a mixed number.

Worked Solution: Since $11 \div 4 = 2$ remainder 3, $\frac{11}{4} = 2\frac{3}{4}$.

Worked Solution: Starter 1, Question 4

Question: Complete the addition represented by the bars to the left:

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

Worked Solution:

Worked Solution: Starter 1, Question 4

Question: Complete the addition represented by the bars to the left:

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

Worked Solution: The first bar shows 2 blue fifths and 1 orange fifth, which together make 3 green fifths: $\frac{2}{5} + \frac{1}{5} = \frac{3}{5}$.

Worked Solution: Starter 1, Question 5

Question: Calculate:

$$\frac{1}{7} + \frac{3}{7} \qquad \frac{5}{9} + \frac{2}{9}$$

Worked Solution:

Worked Solution: Starter 1, Question 5

Question: Calculate:

$$\frac{1}{7} + \frac{3}{7} \qquad \frac{5}{9} + \frac{2}{9}$$

Worked Solution: Add the numerators and keep the denominator the same: $\frac{1+3}{7} = \frac{4}{7}$ and $\frac{5+2}{9} = \frac{7}{9}$.

Worked Solution: Starter 1, Question 6

Question: To add $\frac{1}{2} + \frac{1}{4}$, what must you do first? Can you draw a picture to demonstrate?

Worked Solution:

Worked Solution: Starter 1, Question 6

Question: To add $\frac{1}{2} + \frac{1}{4}$, what must you do first? Can you draw a picture to demonstrate?

Worked Solution: First rewrite $\frac{1}{2}$ with denominator 4: $\frac{1}{2} = \frac{2}{4}$. Then $\frac{2}{4} + \frac{1}{4} = \frac{3}{4}$. A picture can show the half split into two quarters, so two quarters plus one quarter is three quarters.

Worked Solution: Starter 1, Question 7

Question: Calculate: $\frac{1}{2} + \frac{1}{4}$.

Worked Solution:

Worked Solution: Starter 1, Question 7

Question: Calculate: $\frac{1}{2} + \frac{1}{4}$.

Worked Solution: $\frac{1}{2} + \frac{1}{4} = \frac{2}{4} + \frac{1}{4} = \frac{3}{4}$.

Worked Solution: Starter 1, Question 8

Question: Calculate: $\frac{1}{3} + \frac{1}{4}$.

Worked Solution:

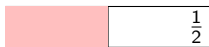
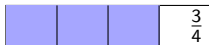
Worked Solution: Starter 1, Question 8

Question: Calculate: $\frac{1}{3} + \frac{1}{4}$.

Worked Solution: Use a common denominator of 12:

$$\frac{1}{3} + \frac{1}{4} = \frac{4}{12} + \frac{3}{12} = \frac{7}{12}.$$

Starter 2



1. Write 3 fractions equivalent to $\frac{2}{3}$.

2. Order smallest to largest: $\frac{1}{8}$, $\frac{1}{2}$, $\frac{1}{12}$

3. Convert $2\frac{3}{7}$ to an improper fraction.

4. Complete the subtraction represented by the bars to the left:

$$\frac{4}{6} - \frac{?}{6} = \frac{?}{6} = \frac{1}{?}$$

5. Calculate:

$$\frac{7}{10} - \frac{3}{10} \qquad \frac{8}{9} - \frac{5}{9}$$

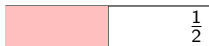
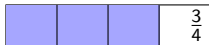
6. Use the bars to work out $\frac{3}{4} - \frac{1}{2}$.

7. Calculate: $\frac{5}{6} - \frac{1}{4}$

8. Calculate: $\frac{7}{8} - \frac{2}{3}$

9. Order smallest to largest: $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{12}$

Starter 2



1. Write 3 fractions equivalent to $\frac{2}{3}$. $\frac{4}{6}, \frac{6}{9}, \frac{8}{12}$

2. Order smallest to largest: $\frac{1}{8}, \frac{1}{2}, \frac{1}{12}$ $\frac{1}{12} < \frac{1}{8} < \frac{1}{2}$

3. Convert $2\frac{3}{7}$ to an improper fraction. $= \frac{17}{7}$

4. Complete the subtraction represented by the bars to the left:

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

5. Calculate:

$$\frac{7}{10} - \frac{3}{10} \quad \frac{8}{9} - \frac{5}{9}$$

$$= \frac{2}{5}, \frac{1}{3}$$

6. Use the bars to work out $\frac{3}{4} - \frac{1}{2}$. $= \frac{1}{4}$

7. Calculate: $\frac{5}{6} - \frac{1}{4} = \frac{7}{12}$ 8. Calculate: $\frac{7}{8} - \frac{2}{3} = \frac{5}{24}$

9. Order smallest to largest: $\frac{3}{8}, \frac{1}{2}, \frac{5}{12}$ $\frac{3}{8} < \frac{5}{12} < \frac{1}{2}$

Worked Solution: Starter 2, Question 1

Question: Write 3 fractions equivalent to $\frac{2}{3}$.

Worked Solution:

Worked Solution: Starter 2, Question 1

Question: Write 3 fractions equivalent to $\frac{2}{3}$.

Worked Solution: Multiply the numerator and denominator by the same number: $\frac{2}{3} = \frac{4}{6} = \frac{6}{9} = \frac{8}{12}$.

Worked Solution: Starter 2, Question 2

Question: Order smallest to largest: $\frac{1}{8}$, $\frac{1}{2}$, $\frac{1}{12}$.

Worked Solution:

Worked Solution: Starter 2, Question 2

Question: Order smallest to largest: $\frac{1}{8}$, $\frac{1}{2}$, $\frac{1}{12}$.

Worked Solution: Use denominator 24: $\frac{1}{8} = \frac{3}{24}$, $\frac{1}{2} = \frac{12}{24}$, $\frac{1}{12} = \frac{2}{24}$, so
 $\frac{1}{12} < \frac{1}{8} < \frac{1}{2}$.

Worked Solution: Starter 2, Question 3

Question: Convert $2\frac{3}{7}$ to an improper fraction.

Worked Solution:

Worked Solution: Starter 2, Question 3

Question: Convert $2\frac{3}{7}$ to an improper fraction.

Worked Solution: $2\frac{3}{7} = \frac{2 \times 7 + 3}{7} = \frac{17}{7}$.

Worked Solution: Starter 2, Question 4

Question: Complete the subtraction represented by the bars to the left:

$$\frac{4}{6} - \frac{?}{6} = \frac{?}{6} = \frac{1}{?}$$

Worked Solution:

Worked Solution: Starter 2, Question 4

Question: Complete the subtraction represented by the bars to the left:

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

Worked Solution: Starting from $\frac{4}{6}$, remove one sixth; the green bar shows $\frac{3}{6}$ left, which simplifies to $\frac{1}{2}$.

Worked Solution: Starter 2, Question 5

Question: Calculate:

$$\frac{7}{10} - \frac{3}{10} \qquad \frac{8}{9} - \frac{5}{9}$$

Worked Solution:

Worked Solution: Starter 2, Question 5

Question: Calculate:

$$\frac{7}{10} - \frac{3}{10} \quad \frac{8}{9} - \frac{5}{9}$$

Worked Solution: Subtract the numerators and keep the denominator:

$$\frac{7-3}{10} = \frac{4}{10} = \frac{2}{5} \text{ and } \frac{8-5}{9} = \frac{3}{9} = \frac{1}{3}.$$

Worked Solution: Starter 2, Question 6

Question: Use the bars to work out $\frac{3}{4} - \frac{1}{2}$.

Worked Solution:

Worked Solution: Starter 2, Question 6

Question: Use the bars to work out $\frac{3}{4} - \frac{1}{2}$.

Worked Solution: Rewrite $\frac{1}{2}$ as $\frac{2}{4}$; the bars show $\frac{3}{4}$ take away the shaded half leaves one quarter: $\frac{3}{4} - \frac{2}{4} = \frac{1}{4}$.

Worked Solution: Starter 2, Question 7

Question: Calculate: $\frac{5}{6} - \frac{1}{4}$.

Worked Solution:

Worked Solution: Starter 2, Question 7

Question: Calculate: $\frac{5}{6} - \frac{1}{4}$.

Worked Solution: Use denominator 12: $\frac{5}{6} - \frac{1}{4} = \frac{10}{12} - \frac{3}{12} = \frac{7}{12}$.

Worked Solution: Starter 2, Question 8

Question: Calculate: $\frac{7}{8} - \frac{2}{3}$.

Worked Solution:

Worked Solution: Starter 2, Question 8

Question: Calculate: $\frac{7}{8} - \frac{2}{3}$.

Worked Solution: Use denominator 24: $\frac{7}{8} - \frac{2}{3} = \frac{21}{24} - \frac{16}{24} = \frac{5}{24}$.

Worked Solution: Starter 2, Question 9

Question: Order smallest to largest: $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{12}$.

Worked Solution:

Worked Solution: Starter 2, Question 9

Question: Order smallest to largest: $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{12}$.

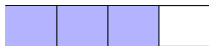
Worked Solution: Use denominator 24: $\frac{3}{8} = \frac{9}{24}$, $\frac{1}{2} = \frac{12}{24}$, $\frac{5}{12} = \frac{10}{24}$, so
 $\frac{3}{8} < \frac{5}{12} < \frac{1}{2}$.

Starter 3

1. $\frac{2}{5} + \frac{1}{5}$

2. $\frac{3}{4} - \frac{1}{2}$

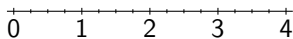
3. Simplify: $\frac{36}{48}$



+



=



4. Fill in the blanks using the diagram:

$$\frac{?}{4} + 1\frac{?}{?} = \frac{?}{4} + \frac{?}{4} = \frac{?}{4} = ?\frac{1}{?}$$

5.

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

6.

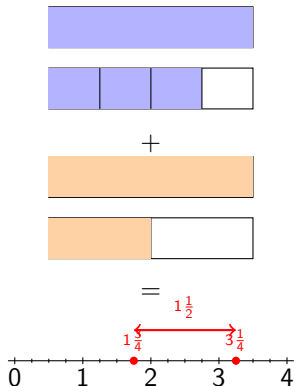
$$3\frac{1}{4} + 1\frac{1}{2}$$

7. Mark $1\frac{3}{4}$ and $3\frac{1}{4}$ on the number line. What is the difference? How else could you work this out?

8. Calculate: $2^2 + 1^3$ Calculate: $1^3 + 3^1$

Starter 3

$$1. \frac{2}{5} + \frac{1}{5} = \frac{3}{5} \quad 2. \frac{3}{4} - \frac{1}{2} = \frac{1}{4} \quad 3. \text{ Simplify: } \frac{36}{48} = \frac{3}{4}$$



4. Fill in the blanks using the diagram:

$$1\frac{3}{4} + 1\frac{1}{2} = \frac{7}{4} + \frac{6}{4} = \frac{13}{4} = 3\frac{1}{4}$$

5.

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

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

6.

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

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

7. Mark $1\frac{3}{4}$ and $3\frac{1}{4}$ on the number line. What is the difference? How else could you work this out? Difference $= \frac{3}{2} = 1\frac{1}{2}$; work out as $3\frac{1}{4} - 1\frac{3}{4} = \frac{13}{4} - \frac{7}{4} = \frac{6}{4} = \frac{3}{2}$.

8. Calculate: $2\frac{2}{3} + 1\frac{3}{4}$ Calculate: $1\frac{3}{4} - 3\frac{1}{2}$

Worked Solution: Starter 3, Question 1

Question: $\frac{2}{5} + \frac{1}{5}$.

Worked Solution:

Worked Solution: Starter 3, Question 1

Question: $\frac{2}{5} + \frac{1}{5}$.

Worked Solution: $\frac{2}{5} + \frac{1}{5} = \frac{2+1}{5} = \frac{3}{5}$.

Worked Solution: Starter 3, Question 2

Question: $\frac{3}{4} - \frac{1}{2}$.

Worked Solution:

Worked Solution: Starter 3, Question 2

Question: $\frac{3}{4} - \frac{1}{2}$.

Worked Solution: Rewrite $\frac{1}{2}$ as $\frac{2}{4}$: $\frac{3}{4} - \frac{2}{4} = \frac{1}{4}$.

Worked Solution: Starter 3, Question 3

Question: Simplify: $\frac{36}{48}$.

Worked Solution:

Worked Solution: Starter 3, Question 3

Question: Simplify: $\frac{36}{48}$.

Worked Solution: HCF of 36 and 48 is 12: $\frac{36}{48} = \frac{36 \div 12}{48 \div 12} = \frac{3}{4}$.

Worked Solution: Starter 3, Question 4

Question: Fill in the blanks using the diagram:

$$\overset{\text{blue}}{?}\frac{\overset{\text{blue}}{?}}{4} + \overset{\text{orange}}{1}\frac{\overset{\text{orange}}{?}}{\overset{\text{orange}}{?}} = \frac{?}{4} + \frac{?}{4} = \frac{?}{4} = \overset{?}{?}\frac{1}{?}$$

Worked Solution:

Worked Solution: Starter 3, Question 4

Question: Fill in the blanks using the diagram:

$$1\frac{3}{4} + 1\frac{1}{2} = \frac{7}{4} + \frac{6}{4} = \frac{13}{4} = 3\frac{1}{4}$$

Worked Solution: The diagram shows $1\frac{3}{4} = \frac{7}{4}$ and $1\frac{1}{2} = \frac{6}{4}$, so
 $\frac{7}{4} + \frac{6}{4} = \frac{13}{4} = 3\frac{1}{4}$.

Worked Solution: Starter 3, Question 5

Question:

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

Worked Solution:

Worked Solution: Starter 3, Question 5

Question:

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

Worked Solution: $2\frac{1}{3} + 1\frac{1}{3} = \frac{7}{3} + \frac{4}{3} = \frac{11}{3} = 3\frac{2}{3}.$

Worked Solution: Starter 3, Question 6

Question:

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

Worked Solution:

Worked Solution: Starter 3, Question 6

Question:

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

Worked Solution: $3\frac{1}{4} + 1\frac{1}{2} = \frac{13}{4} + \frac{6}{4} = \frac{19}{4} = 4\frac{3}{4}.$

Worked Solution: Starter 3, Question 7

Question: Mark $1\frac{3}{4}$ and $3\frac{1}{4}$ on the number line. What is the difference? How else could you work this out?

Worked Solution:

Worked Solution: Starter 3, Question 7

Question: Mark $1\frac{3}{4}$ and $3\frac{1}{4}$ on the number line. What is the difference? How else could you work this out?

Worked Solution: The difference is $3\frac{1}{4} - 1\frac{3}{4} = \frac{13}{4} - \frac{7}{4} = \frac{6}{4} = \frac{3}{2} = 1\frac{1}{2}$.
Alternatively, count the number of quarters from $1\frac{3}{4}$ to $3\frac{1}{4}$; there are 6 quarters, i.e. $1\frac{1}{2}$.

Worked Solution: Starter 3, Question 8

Question: Calculate: $2\frac{2}{3} + 1\frac{3}{4}$.

Worked Solution:

Worked Solution: Starter 3, Question 8

Question: Calculate: $2\frac{2}{3} + 1\frac{3}{4}$.

Worked Solution: $\frac{8}{3} + \frac{7}{4} = \frac{32}{12} + \frac{21}{12} = \frac{53}{12} = 4\frac{5}{12}$.

Worked Solution: Starter 3, Question 9

Question: Calculate $1\frac{3}{4} - 3\frac{1}{4}$.

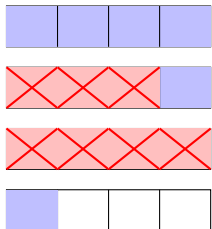
Worked Solution:

Worked Solution: Starter 3, Question 9

Question: Calculate $1\frac{3}{4} - 3\frac{1}{4}$.

Worked Solution: $\frac{7}{4} - \frac{13}{4} = -\frac{6}{4} = -\frac{3}{2} = -1\frac{1}{2}$.

Starter 4



1. Which is greater: $2\frac{1}{3}$ or $2\frac{2}{5}$?
2. Convert $\frac{23}{6}$ to a mixed number.
3. Consider the diagram on the left, fill in the blanks to demonstrate subtraction using improper fractions:

$$3\frac{1}{4} - 1\frac{3}{4} = \frac{?}{4} - \frac{?}{4} = \frac{?}{4} = \frac{?}{?}$$

4.

$$3\frac{3}{5} - 1\frac{1}{5}$$

5.

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

6.

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

7.

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

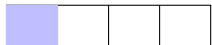
8.

$$1\frac{1}{2} - 3\frac{1}{3}$$

9.

$$1\frac{1}{2} - 3\frac{1}{3}$$

Starter 4



- Which is greater: $2\frac{1}{3}$ or $2\frac{2}{5}$? $2\frac{2}{5}$
- Convert $\frac{23}{6}$ to a mixed number. $= 3\frac{5}{6}$
- Consider the diagram on the left, fill in the blanks to demonstrate subtraction using improper fractions:

$$3\frac{1}{4} - 1\frac{3}{4} = \frac{13}{4} - \frac{7}{4} = \frac{6}{4} = 1\frac{2}{4}$$

4.

$$3\frac{3}{5} - 1\frac{1}{5}$$

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

5.

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

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

6.

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

$$= 3\frac{11}{12}$$

7.

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

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

8.

$$1\frac{1}{2} - 1\frac{1}{3}$$

9.

$$1\frac{1}{2} - 2\frac{1}{3}$$

Worked Solution: Starter 4, Question 1

Question: Which is greater: $2\frac{1}{3}$ or $2\frac{2}{5}$?

Worked Solution:

Worked Solution: Starter 4, Question 1

Question: Which is greater: $2\frac{1}{3}$ or $2\frac{2}{5}$?

Worked Solution: Compare the fractional parts: $\frac{1}{3} = \frac{5}{15}$ and $\frac{2}{5} = \frac{6}{15}$, so $2\frac{1}{3} < 2\frac{2}{5}$; hence $2\frac{2}{5}$ is greater.

Worked Solution: Starter 4, Question 2

Question: Convert $\frac{23}{6}$ to a mixed number.

Worked Solution:

Worked Solution: Starter 4, Question 2

Question: Convert $\frac{23}{6}$ to a mixed number.

Worked Solution: $23 \div 6 = 3$ remainder 5, so $\frac{23}{6} = 3\frac{5}{6}$.

Worked Solution: Starter 4, Question 3

Question: Consider the diagram on the left, fill in the blanks to demonstrate subtraction using improper fractions:

$$3\frac{1}{4} - 1\frac{3}{4} = \frac{?}{4} - \frac{?}{4} = \frac{?}{4} = \frac{?}{?}$$

Worked Solution:

Worked Solution: Starter 4, Question 3

Question: Consider the diagram on the left, fill in the blanks to demonstrate subtraction using improper fractions:

$$3\frac{1}{4} - 1\frac{3}{4} = \frac{13}{4} - \frac{7}{4} = \frac{6}{4} = 1\frac{2}{4}$$

Worked Solution: Convert: $3\frac{1}{4} = \frac{13}{4}$ and $1\frac{3}{4} = \frac{7}{4}$; then $\frac{13}{4} - \frac{7}{4} = \frac{6}{4} = 1\frac{2}{4} = 1\frac{1}{2}$.

Worked Solution: Starter 4, Question 4

Question:

$$3\frac{3}{5} - 1\frac{1}{5}$$

Worked Solution:

Worked Solution: Starter 4, Question 4

Question:

$$3\frac{3}{5} - 1\frac{1}{5}$$

Worked Solution: $3\frac{3}{5} - 1\frac{1}{5} = \frac{18}{5} - \frac{6}{5} = \frac{12}{5} = 2\frac{2}{5}.$

Worked Solution: Starter 4, Question 5

Question:

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

Worked Solution:

Worked Solution: Starter 4, Question 5

Question:

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

Worked Solution: $4\frac{5}{6} - 2\frac{1}{6} = \frac{29}{6} - \frac{13}{6} = \frac{16}{6} = \frac{8}{3} = 2\frac{2}{3}.$

Worked Solution: Starter 4, Question 6

Question:

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

Worked Solution:

Worked Solution: Starter 4, Question 6

Question:

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

Worked Solution: $\frac{5}{3} + \frac{9}{4} = \frac{20}{12} + \frac{27}{12} = \frac{47}{12} = 3\frac{11}{12}.$

Worked Solution: Starter 4, Question 7

Question:

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

Worked Solution:

Worked Solution: Starter 4, Question 7

Question:

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

Worked Solution: $4\frac{1}{4} - 1\frac{1}{2} = \frac{17}{4} - \frac{6}{4} = \frac{11}{4} = 2\frac{3}{4}.$

Worked Solution: Starter 4, Question 8

Question:

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

Worked Solution:

Worked Solution: Starter 4, Question 8

Question:

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

Worked Solution: $\frac{10}{3} - \frac{7}{4} = \frac{40}{12} - \frac{21}{12} = \frac{19}{12} = 1\frac{7}{12}.$

Worked Solution: Starter 4, Question 9

Question:

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

Worked Solution:

Worked Solution: Starter 4, Question 9

Question:

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

Worked Solution: $\frac{16}{3} - \frac{11}{4} = \frac{64}{12} - \frac{33}{12} = \frac{31}{12} = 2\frac{7}{12}.$

Starter 5

1. Fully simplify: $\frac{15}{20}$

2. Fully simplify: $\frac{72}{96}$

3. Use the fraction wall to fill in the blanks:

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

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

5. $4\frac{1}{5} - 1\frac{3}{4}$

Fraction wall

1

$\frac{1}{2}$

$\frac{1}{2}$

$\frac{1}{3}$

$\frac{1}{3}$

$\frac{1}{3}$

$\frac{1}{6}$

$\frac{1}{6}$

$\frac{1}{6}$

$\frac{1}{6}$

$\frac{1}{6}$

$\frac{1}{6}$

$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$
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6. Maya says: " $\frac{1}{2} + \frac{1}{3} = \frac{2}{5}$ ". Explain the mistake and find the correct answer.

7. Amir eats $\frac{3}{8}$, Beth eats $\frac{1}{4}$, Cal eats $\frac{1}{3}$ of a pizza. What fraction is left?

8. Fill in the blanks: $3\frac{1}{4} + \underline{\hspace{1cm}} = 5\frac{1}{6}$

9. True or false? $\frac{a}{b} + \frac{a}{c} = \frac{2a}{b+c}$. Can you explain your

Starter 5

1. Fully simplify: $\frac{15}{20} = \frac{3}{4}$ 2. Fully simplify: $\frac{72}{96} = \frac{3}{4}$

3. Use the fraction wall to fill in the blanks:

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

4. $2\frac{3}{4} + 1\frac{2}{3} = 4\frac{5}{12}$ 5. $4\frac{1}{5} - 1\frac{3}{4} = 2\frac{9}{20}$

Fraction wall

1

$\frac{1}{2}$

$\frac{1}{2}$

$\frac{1}{3}$

$\frac{1}{3}$

$\frac{1}{3}$

$\frac{1}{6}$

$\frac{1}{6}$

$\frac{1}{6}$

$\frac{1}{6}$

$\frac{1}{6}$

$\frac{1}{6}$

$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$
----------------	----------------	----------------	----------------	----------------	----------------	----------------	----------------	----------------	----------------	----------------	----------------	----------------	----------------	----------------	----------------

6. Maya says: " $\frac{1}{2} + \frac{1}{3} = \frac{2}{5}$ ". Explain the mistake and find the correct answer. **She added the denominators too; use a common denominator: $\frac{3}{6} + \frac{2}{6} = \frac{5}{6}$.**

7. Amir eats $\frac{3}{8}$, Beth eats $\frac{1}{4}$, Cal eats $\frac{1}{3}$ of a pizza.
What fraction is left? $\frac{1}{24}$

8. Fill in the blanks: $3\frac{1}{4} + 1\frac{11}{12} = 5\frac{1}{6}$

9. True or false? $\frac{a}{b} + \frac{a}{c} = \frac{2a}{b+c}$. Can you explain your

Worked Solution: Starter 5, Question 1

Question: Fully simplify: $\frac{15}{20}$.

Worked Solution:

Worked Solution: Starter 5, Question 1

Question: Fully simplify: $\frac{15}{20}$.

Worked Solution: HCF of 15 and 20 is 5: $\frac{15}{20} = \frac{15 \div 5}{20 \div 5} = \frac{3}{4}$.

Worked Solution: Starter 5, Question 2

Question: Fully simplify: $\frac{72}{96}$.

Worked Solution:

Worked Solution: Starter 5, Question 2

Question: Fully simplify: $\frac{72}{96}$.

Worked Solution: HCF of 72 and 96 is 24: $\frac{72}{96} = \frac{72 \div 24}{96 \div 24} = \frac{3}{4}$.

Worked Solution: Starter 5, Question 3

Question: Use the fraction wall to fill in the blanks:

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

Worked Solution:

Worked Solution: Starter 5, Question 3

Question: Use the fraction wall to fill in the blanks:

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

Worked Solution: Using the wall, $\frac{1}{2} = \frac{3}{6}$, so $\frac{1}{2} + \frac{3}{6} = 1$; and $\frac{1}{3} = \frac{2}{6}$, so $\frac{2}{6} + \frac{4}{6} = 1$, which is the same as $\frac{1}{3} + \frac{4}{6} = 1$.

Worked Solution: Starter 5, Question 4

Question: $2\frac{3}{4} + 1\frac{2}{3}$.

Worked Solution:

Worked Solution: Starter 5, Question 4

Question: $2\frac{3}{4} + 1\frac{2}{3}$.

Worked Solution: $\frac{11}{4} + \frac{5}{3} = \frac{33}{12} + \frac{20}{12} = \frac{53}{12} = 4\frac{5}{12}$.

Worked Solution: Starter 5, Question 5

Question: $4\frac{1}{5} - 1\frac{3}{4}$.

Worked Solution:

Worked Solution: Starter 5, Question 5

Question: $4\frac{1}{5} - 1\frac{3}{4}$.

Worked Solution: $\frac{21}{5} - \frac{7}{4} = \frac{84}{20} - \frac{35}{20} = \frac{49}{20} = 2\frac{9}{20}$.

Worked Solution: Starter 5, Question 6

Question: Maya says: " $\frac{1}{2} + \frac{1}{3} = \frac{2}{5}$ ". Explain the mistake and find the correct answer.

Worked Solution:

Worked Solution: Starter 5, Question 6

Question: Maya says: " $\frac{1}{2} + \frac{1}{3} = \frac{2}{5}$ ". Explain the mistake and find the correct answer.

Worked Solution: She added the denominators as well as the numerators. Use a common denominator: $\frac{1}{2} + \frac{1}{3} = \frac{3}{6} + \frac{2}{6} = \frac{5}{6}$.

Worked Solution: Starter 5, Question 7

Question: Amir eats $\frac{3}{8}$, Beth eats $\frac{1}{4}$, Cal eats $\frac{1}{3}$ of a pizza. What fraction is left?

Worked Solution:

Worked Solution: Starter 5, Question 7

Question: Amir eats $\frac{3}{8}$, Beth eats $\frac{1}{4}$, Cal eats $\frac{1}{3}$ of a pizza. What fraction is left?

Worked Solution: Total eaten: $\frac{3}{8} + \frac{1}{4} + \frac{1}{3} = \frac{9}{24} + \frac{6}{24} + \frac{8}{24} = \frac{23}{24}$. Left:
 $1 - \frac{23}{24} = \frac{1}{24}$.

Worked Solution: Starter 5, Question 8

Question: Fill in the blanks: $3\frac{1}{4} + \underline{\hspace{1cm}} = 5\frac{1}{6}$.

Worked Solution:

Worked Solution: Starter 5, Question 8

Question: Fill in the blanks: $3\frac{1}{4} + 1\frac{11}{12} = 5\frac{1}{6}$.

Worked Solution: Subtract $3\frac{1}{4}$ from $5\frac{1}{6}$:

$$5\frac{1}{6} - 3\frac{1}{4} = \frac{31}{6} - \frac{13}{4} = \frac{62}{12} - \frac{39}{12} = \frac{23}{12} = 1\frac{11}{12}.$$

Worked Solution: Starter 5, Question 9

Question: True or false? $\frac{a}{b} + \frac{a}{c} = \frac{2a}{b+c}$. Can you explain your answer with a proof/counterexample?

Worked Solution:

Worked Solution: Starter 5, Question 9

Question: True or false? $\frac{a}{b} + \frac{a}{c} = \frac{2a}{b+c}$. Can you explain your answer with a proof/counterexample?

Worked Solution: False. Take $a = b = c = 1$: the left side is $1 + 1 = 2$, but the right side is $\frac{2}{2} = 1$. In fact $\frac{a}{b} + \frac{a}{c} = \frac{a(c+b)}{bc}$.