

TestGenie
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Mathematics — Class 7

Chapter(s): Working with Fractions

Maximum Marks: 39

Time Allowed: 1 Hour 10 Minutes

Section A — MCQ & Assertion-Reason (1 mark each)

Q1. A recipe uses $\frac{3}{4}$ cup of sugar for 1 cake. How much sugar is needed for $2\frac{2}{3}$ cakes? [1 mark]

- A) 2 cups
- B) $\frac{7}{4}$ cups
- C) $\frac{3}{2}$ cups
- D) $\frac{5}{2}$ cups

Q2. Which expression gives the correct value of: $1 - (\frac{3}{4} \times \frac{2}{5})$? [1 mark]

- A)
- B) $\frac{7}{10}$
- C) $\frac{3}{20}$
- D) $\frac{17}{20}$

Q3. A cyclist covers 12 km in $\frac{3}{4}$ hour at uniform speed. How far will he travel in hour? [1 mark]

- A) 10 km
- B) $12\frac{1}{2}$ km
- C) $13\frac{1}{3}$ km
- D) 16 km

Q4. Simplify by cancelling common factors first: $(\frac{18}{35}) \times (\frac{21}{24})$ [1 mark]

- A) $\frac{9}{20}$
- B) $\frac{3}{10}$
- C) $\frac{27}{40}$
- D) $\frac{7}{30}$

Q5. A shopkeeper has $8\frac{1}{4}$ kg rice. He packs it into bags of $\frac{3}{8}$ kg each. How many full bags can he make? [1 mark]

- A) 20
- B) 21
- C) 22
- D) 23

Q6. Assertion (A): If a fraction is divided by another fraction between 0 and 1, the quotient is greater than the dividend.

Reason (R): Dividing by a fraction between 0 and 1 is the same as multiplying by its reciprocal, which is greater than 1. [1 mark]

- A) Both A and R are true and R is the correct explanation of A.
- B) Both A and R are true but R is not the correct explanation of A.
- C) A is true but R is false.
- D) A is false but R is true.

Q7. Assertion (A): For non-zero fractions $[a] / [b]$ and $[c] / [d]$, $([a] / [b]) \times ([c] / [d]) = [ac] / [bd]$.

Reason (R): Multiplication of fractions can be modelled by the area of a rectangle whose sides are $[a] / [b]$ and $[c] / [d]$ of a unit length. [1 mark]

- A) Both A and R are true and R is the correct explanation of A.
- B) Both A and R are true but R is not the correct explanation of A.
- C) A is true but R is false.
- D) A is false but R is true.

Q8. Assertion (A): The product of two fractions, each between 0 and 1, is less than each of the two fractions.

Reason (R): Multiplying by a number between 0 and 1 scales a quantity down (makes it smaller) without changing its sign. [1 mark]

- A) Both A and R are true and R is the correct explanation of A.
- B) Both A and R are true but R is not the correct explanation of A.
- C) A is true but R is false.
- D) A is false but R is true.

Q9. Assertion (A): If a non-zero fraction is divided by a fraction greater than 1, then the quotient is smaller than the dividend.

Reason (R): Dividing by a fraction greater than 1 is the same as multiplying by its reciprocal, which lies between 0 and 1. [1 mark]

- A) Both A and R are true and R is the correct explanation of A.
- B) Both A and R are true but R is not the correct explanation of A.
- C) A is true but R is false.
- D) A is false but R is true.

Q10. Assertion (A): For any non-zero fractions $[a] / [b]$ and $[c] / [d]$, $([a] / [b]) \div ([c] / [d]) = [a \times d] / [b \times c]$.

Reason (R): Because dividing by a fraction is the same as multiplying by its reciprocal, so $([a] / [b]) \div ([c] / [d]) = ([a] / [b]) \times ([d] / [c])$. [1 mark]

- A) Both A and R are true and R is the correct explanation of A.
- B) Both A and R are true but R is not the correct explanation of A.
- C) A is true but R is false.
- D) A is false but R is true.

Section B — Very Short Answer (2 marks each)

Q11. A shop mixes L of juice with $\frac{7}{10}$ L of water. What fraction of the mixture is juice? (Answer in exactly 2 sentences, include unit L.) [2 marks]

Q12. Evaluate: $(\frac{5}{12}) \div (\frac{5}{18})$. (Answer in exactly 2 sentences.) [2 marks]

Q13. A wire of length $\frac{7}{9}$ m is cut into pieces of length m each. How many complete pieces are obtained? (Answer in exactly 2 sentences, include unit m.) [2 marks]

Section C — Short Answer (3 marks each)

Q14. A rectangular garden has length $\frac{7}{6}$ m and breadth $\frac{5}{9}$ m.

- (i) Find its area in m^2 .
 - (ii) If of the garden is planted with flowers, find the area planted with flowers in m^2 .
- Write the answer in exactly 3 numbered steps. [3 marks]

Q15. A machine fills $\frac{3}{8}$ litre of oil in minute.

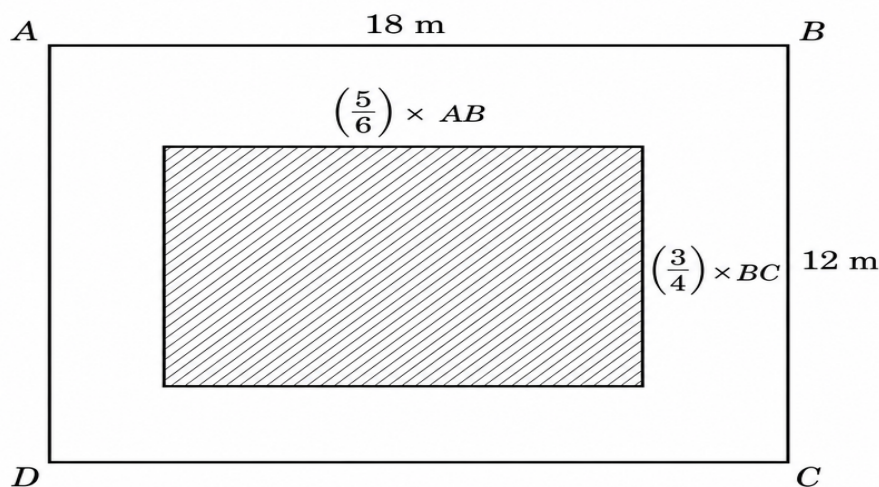
- (i) Find the rate of filling in litres per minute.
 - (ii) How much oil will it fill in $\frac{3}{2}$ minutes at the same rate?
- Write the answer in exactly 3 numbered steps. [3 marks]

Q16. A student claims: "If I divide any number by a fraction, the answer always becomes smaller." Use one counterexample and one principle statement to decide whether the claim is correct.

Write the answer in exactly 3 numbered points. [3 marks]

Section D — Long Answer (5 marks each)

Q17. The given figure shows a rectangular garden ABCD. $AB = 18$ m and $BC = 12$ m. A straight walkway (shaded) is laid inside the garden such that its length is $(\frac{5}{6})$ of AB and its breadth is $(\frac{3}{4})$ of BC. (a) Find the area of the walkway.
 (b) Find what fraction of the whole garden's area is covered by the walkway.
 (c) Decide whether the area of the walkway is greater than, less than, or equal to half the garden's area. Justify using fractions (not decimals). [5 marks]



Q18. A water tanker is filled by two inlet pipes.

- Pipe A can fill $\left(\frac{3}{8}\right)$ of the tanker in 1 hour.
 - Pipe B can fill $\left(\frac{5}{12}\right)$ of the tanker in 1 hour. (i) What fraction of the tanker is filled in 1 hour if both pipes run together?
 - (ii) How many hours will they take to fill the whole tanker together?
 - (iii) After running together for $\left(\frac{3}{5}\right)$ hour, what fraction of the tanker is still empty?
- Answer all parts with simplified fractions and show step-wise working. [5 marks]**

Section E — Case Study (4 marks each)
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Q19. Read the following passage and answer the questions that follow: [4 marks]

A trekking club plans a "fractional distance" training route. The complete route from Start (S) to Finish (F) is 18 km. On the first day, the group covers $\frac{2}{3}$ of the route. On the second day, they cover $\frac{3}{4}$ of the remaining distance. On the third day, due to rain, they cover only of what is still left after Day 2.

The coach wants to analyse whether their progress pattern makes sense. She reminds the team that multiplying by a fraction less than 1 reduces a quantity, while dividing by a fraction less than 1 increases it. She also asks them to express all answers in simplest fraction form and include correct units. The team must calculate distances precisely without using decimals so that the plan can be reused for different route lengths.

- (i) How many kilometres are covered on Day 1? (1 mark)
- (ii) How many kilometres remain after Day 2? (1 mark)
- (iii) After Day 3, what fraction of the original 18 km route is still left to cover? (2 marks)

Mathematics — Class 7
Chapter(s): Working with Fractions

Section A — MCQ & Assertion-Reason (1 mark each)

A1.

Answer:

Correct option: (A)

2 cups

Explanation:

Convert $2\frac{2}{3}$ to $\frac{8}{3}$ and multiply: $(\frac{3}{4}) \times (\frac{8}{3}) = \frac{3 \times 8}{4 \times 3} = \frac{8}{4} = 2$ cups. Hence, option (A) is correct.

A2.

Answer:

Correct option: (B)

$\frac{7}{10}$

Explanation:

First multiply: $(\frac{3}{4}) \times (\frac{2}{5}) = \frac{6}{20} = \frac{3}{10}$; then subtract from 1: $1 - \frac{3}{10} = \frac{7}{10}$. Hence, option (B) is correct.

A3.

Answer:

Correct option: (C)

$13\frac{1}{3}$ km

Explanation:

Speed = $12 \div (\frac{3}{4}) = 12 \times (\frac{4}{3}) = 16$ km/h; distance in $\frac{5}{6}$ h = $16 \times (\frac{5}{6}) = \frac{80}{6} = 13\frac{1}{3}$ km?
Actually $16 \times \frac{5}{6} = \frac{40}{3} = 13\frac{1}{3}$ km, which matches option (C). Hence, option (C) is correct.

A4.

Answer:

Correct option: (A)

$\frac{9}{20}$

Explanation:

Cancel: $18/24 = \frac{3}{4}$ and $21/35 = \frac{3}{5}$, so product = $(3/5) \times (3/4) = 9/20$? Wait after cancellation: $(18/35) \times (21/24) = (3/5) \times (3/4) = 9/20$, matching option (A). Hence, option (A) is correct.

A5.

Answer:

Correct option: (C)

22

Explanation:

Total bags = $(8 \frac{1}{4}) \div (3/8) = (33/4) \times (8/3) = [33 \times 2] / [3] = 66/3 = 22$ full bags. Hence, option (C) is correct.

A6.

Answer:

Correct option: (A)

Both A and R are true and R is the correct explanation of A.

Explanation:

The reciprocal of any fraction between 0 and 1 is greater than 1, so multiplying the dividend by it increases the value. Therefore both statements are true and R explains A. Hence, option (A) is correct.

A7.

Answer:

Correct option: (A)

Both A and R are true and R is the correct explanation of A.

Explanation:

The rectangle model partitions the unit square into b rows and d columns and the overlap gives ac shaded parts out of bd equal parts, yielding $[ac] / [bd]$. Thus R justifies the general multiplication rule in A. Hence, option (A) is correct.

A8.

Answer:

Correct option: (A)

Both A and R are true and R is the correct explanation of A.

Explanation:

If $0 < x < 1$, then $x \cdot y < y$ for any positive y , so when both fractions are in $(0,1)$ each

multiplication reduces the other. R states this scaling idea, which directly explains A. Hence, option (A) is correct.

A9.

Answer:

Correct option: (A)

Both A and R are true and R is the correct explanation of A.

Explanation:

Assertion (A) is true because for any non-zero fraction x and any fraction $y > 1$, we have $x \div y = x \times (1/y)$ and $1/y$ is a fraction between 0 and 1, which reduces the value of x .

Reason (R) is true and directly explains why the quotient becomes smaller: multiplying by a number between 0 and 1 makes a positive fraction smaller in magnitude.

A10.

Answer:

Correct option: (A)

Both A and R are true and R is the correct explanation of A.

Explanation:

Assertion (A) is true since $([a] / [b]) \div ([c] / [d])$ can be rewritten as multiplication by the reciprocal of the divisor: $([a] / [b]) \times ([d] / [c]) = [a \times d] / [b \times c]$, assuming a, b, c, d are non-zero as required. Reason (R) states exactly this reciprocal rule and therefore correctly explains how the division

Formula: in (A) is obtained.

Section B — Very Short Answer (2 marks each)

A11.

Answer:

Total mixture = $\frac{3}{5} L + \frac{7}{10} L = \frac{6}{10} L + \frac{7}{10} L = \frac{13}{10} L$. Fraction of juice = $[\frac{3}{5}] / [\frac{13}{10}] = (\frac{3}{5}) \times (\frac{10}{13}) = \frac{6}{13}$ (unitless fraction of $\frac{13}{10} L$).

A12.

Answer:

Formula: $([a] / [b]) \div ([c] / [d]) = ([a] / [b]) \times ([d] / [c])$, so $(5/12) \div (5/18) = (5/12) \times (18/5)$. Cancelling 5, we get $18/12 = 3/2$ as the

A13.

Answer:

Number of pieces = $(7/9 \text{ m}) \div (1/6 \text{ m}) = (7/9) \times 6 = 42/9 = 14/3$. So 4 complete pieces of length $\frac{1}{6} \text{ m}$ are obtained (with $2/18 \text{ m}$ remaining).

The count of equal pieces equals total length divided by length of one piece. Substituting $7/9 \text{ m}$ and $\frac{1}{6} \text{ m}$ verifies $14/3 = 4 \frac{2}{3}$, so only 4 complete pieces are possible.

Section C — Short Answer (3 marks each)
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A14.

Answer:

1) Area of garden: $A = (7/6) \text{ m} \times (5/9) \text{ m} = 35/54 \text{ m}^2$.

2) Flower area: $(2/5) \text{ of } A = (2/5) \times (35/54) \text{ m}^2 = 70/270 \text{ m}^2 = 7/27 \text{ m}^2$.

3)

(i) $35/54 \text{ m}^2$, (ii) $7/27 \text{ m}^2$.

A15.

Answer:

1) Rate = $(3/8 \text{ L}) \div (1/5 \text{ min}) = (3/8) \times 5 = 15/8 \text{ L/min}$.

2) Oil in $3/2 \text{ min} = (15/8 \text{ L/min}) \times (3/2 \text{ min}) = 45/16 \text{ L}$.

3)

(i) $15/8 \text{ L/min}$, (ii) $45/16 \text{ L}$.

Rate is a division of quantity by time, so we multiply by the reciprocal of time in minutes. Substituting the rate into (rate $\times$ time) verifies the filled oil $45/16 \text{ L}$ with units consistent (min cancels).

A16.

Answer:

1) Counterexample: Take $6 \div (1/2) = 6 \times 2 = 12$, which is greater than 6.

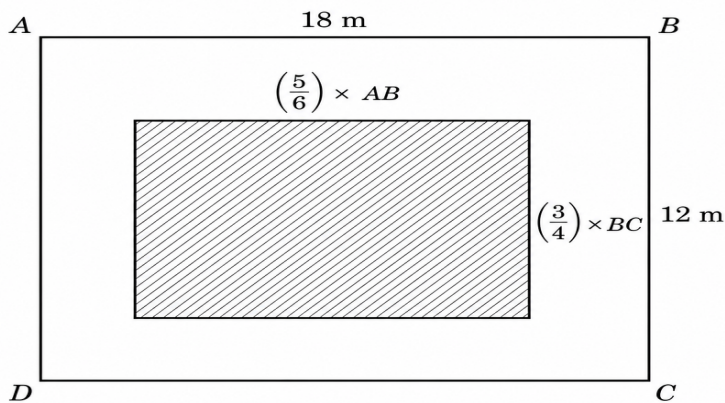
2) Principle: Dividing by a fraction between 0 and 1 increases the number because its reciprocal is greater than 1.

3)

The claim is false; dividing by a proper fraction ($0 < f < 1$) makes the quotient larger, not smaller.

Section D — Long Answer (5 marks each)

A17.



Answer:

Introduction: This problem uses fraction multiplication to scale lengths and then connects rectangle area with product of its sides.

1) Write the

Given: measures with units:

Step 1: $AB = 18\text{ m}$, $BC = 12\text{ m}$.

Step 2: Walkway length = $(5/6)$ of 18 m ; walkway breadth = $(3/4)$ of 12 m .

2) Find the walkway length (fraction $\times$ whole number):

Formula: $(5/6) \times 18\text{ m}$.

Step 1: Cancel common factor: $18 \div 6 =$

3.

Step 2: Multiply: $5 \times 3\text{ m} = 15\text{ m}$.

3) Find the walkway breadth (fraction $\times$ whole number):

Formula: $(3/4) \times 12\text{ m}$.

Step 1: Cancel common factor: $12 \div 4 =$

3.

Step 2: Multiply: $3 \times 3\text{ m} = 9\text{ m}$.

4) Area of the walkway (area = length $\times$ breadth):

Formula: $15\text{ m} \times 9\text{ m}$.

Step 1: Multiply: $15 \times 9 = 135$;

(a): Area of walkway = 135 m^2 .

5) Fraction of garden covered and compare with half:

Step 1: Garden area = $18 \text{ m} \times 12 \text{ m} = 216 \text{ m}^2$.

Step 2: Required fraction = $135/216$.

Step 3: Simplify: $135/216 = [5 \times 27] / [8 \times 27] = \frac{5}{8}$;

(b): Fraction covered = $\frac{5}{8}$ of the garden.

Step 4: Compare $\frac{5}{8}$ with $\frac{1}{2} = \frac{4}{8}$ $\frac{5}{8} > \frac{4}{8}$;

(c): Walkway area is greater than half of the garden's area.

Final

(c): Walkway area is greater than half of the garden's area.

A18.

Answer:

Introduction: We add fractional rates, then use division of fractions (multiply by reciprocal) and finally multiply by a fractional time.

1) Combine the filling done in 1 hour (add fractions):

Given: Rate together = $\frac{3}{8} + \frac{5}{12}$ (tanker per hour).

Step 1: LCM(8,12) =

24.

Step 2: $\frac{3}{8} = \frac{9}{24}$ and $\frac{5}{12} = \frac{10}{24}$.

Step 3: Add: $\frac{9}{24} + \frac{10}{24} = \frac{19}{24}$;

(i): In 1 hour they fill $\frac{19}{24}$ of the tanker.

2) Time to fill 1 whole tanker (division of fractions); We need time = $1 \div (\frac{19}{24})$ hours.

Formula: $1 \times (\frac{24}{19})$.

Step 1: Multiply: $\frac{24}{19}$ hours;

(ii): Time = $\frac{24}{19}$ hours.

3) Filling in $(\frac{3}{5})$ hour (fraction $\times$ fraction):

Given: Filling = $(\frac{19}{24}) \times (\frac{3}{5})$.

Step 1: Cancel: 3 with 24 $\frac{3}{24} = \frac{1}{8}$.

Step 2: Multiply: $(\frac{19}{8}) \times (\frac{1}{5}) = \frac{19}{40}$; So filled in $\frac{3}{5}$ hour = $\frac{19}{40}$ of tanker.

4) Fraction still empty; Empty part = $1 - \frac{19}{40}$.

Step 1: $1 = \frac{40}{40}$.

Step 2: $\frac{40}{40} - \frac{19}{40} = \frac{21}{40}$;

(iii): Fraction still empty = $\frac{21}{40}$.

5) Reasonableness check; Since $\frac{19}{24}$ is close to 1, the full time $\frac{24}{19}$ is a little more than 1 hour, which matches the situation.

Since $19/24$ is close to 1, the full time $24/19$ is a little more than 1 hour, which matches the situation.

Section E — Case Study (4 marks each)
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A19.

(i) How many kilometres are covered on Day 1?

Answer:

Formula: $(2/3) \times 18 \text{ km}$.

Step 1: $18 \div 3 =$

6.

Step 2: $6 \times 2 =$

12.

12 km.

(ii) How many kilometres remain after Day 2?

Answer:

Step 1: Remaining after Day 1 = $18 - 12 = 6 \text{ km}$.

Step 2: Day 2 covers $(3/4)$ of 6 km = $(3/4) \times 6 = 18/4 = 9/2 \text{ km} = 4(1/2) \text{ km}$.

Step 3: Remaining after Day 2 = $6 - 9/2 = 12/2 - 9/2 = 3/2 \text{ km}$.

$3/2 \text{ km}$.

(iii) After Day 3, what fraction of the original 18 km route is still left to cover?

Answer:

Step 1: Distance left after Day 2 = $3/2 \text{ km}$.

Step 2: Day 3 covers $(5/6)$ of this: $(5/6) \times (3/2) = [5 \times 3] / [6 \times 2] = 15/12 = 5/4 \text{ km}$.

Step 3: Left after Day 3 = $(3/2) - (5/4) = 6/4 - 5/4 = 1/4 \text{ km}$.

Step 4: Fraction of original route left = $(1/4 \text{ km}) \div (18 \text{ km}) = (1/4) \times (1/18) = 1/72$.

$1/72$ of the original route.