Fractions (F)

A collection of 9-1 Maths GCSE Sample and Specimen questions from AQA, OCR, Pearson-Edexcel and WJEC Eduqas.

Name:	*Mel @ JustMaths*
Total Marks:	

1. Find $\frac{1}{4}$ of 16.

4

.... [1]

2. Emma has done some calculations.

Explain how you know the answer is wrong without working out the correct answer.

$$\frac{3}{4} + \frac{2}{3} = \frac{5}{7}$$

$\frac{3}{4}$ and $\frac{2}{3}$ are both greater than $\frac{1}{2}$ so the answer will be greater than 1.

[1]

3. In a box of 12 eggs, 5 are cracked.

What fraction is cracked?

$\frac{5}{12}$

.... [1]

4. Work out.

$$\frac{3}{7} + \frac{4}{5}$$

Give your answer as a mixed number.

$\times 5 \left(\frac{3}{7} + \frac{4}{5} \right) \times 7$

$\frac{15}{35} + \frac{28}{35} \times 7 = \frac{43}{35}$

$\frac{4 \, 3}{3 \, 5}$ -35 $\frac{}{8}$

$1\frac{8}{35}$

.... [3]

5. Find a fraction between $\frac{1}{4}$ and $\frac{1}{3}$.

$\times 3 \left(\frac{3}{12} \quad \frac{4}{12} \right) \times 4$

$\times 6 \left(\frac{\frac{1}{4}}{\frac{6}{24}} \quad \frac{\frac{1}{3}}{\frac{8}{24}} \right) \times 8$

$\frac{7}{24}$

.... [2]

hmmm!!

$\frac{7}{24}$

6. Jemma has a bag containing 24 balls.

The probability that a ball taken from the bag at random is green is 1/3

How many of the 24 balls are green?

$P(green) = \dfrac{1}{3}$ $\dfrac{1}{3} \times 24$

................8................ [2]

7. Circle the fraction that is not equivalent to $\dfrac{3}{8}$

$\overset{\times 2}{\dfrac{3}{8} \,\, \dfrac{6}{16}}$

$\overset{\times 2}{\dfrac{3}{8} \,\, \dfrac{6}{16}}$ $\overset{\times 3}{\dfrac{3}{8} \,\, \dfrac{9}{24}}$ $\overset{\times 4}{\dfrac{3}{8} \,\, \dfrac{12}{32}}$ $\boxed{\dfrac{15}{35}}$

[1]

8. Complete the table.

$\dfrac{40}{60} = \dfrac{4}{6} = \dfrac{2}{3}$

Minutes	Hours
30	$\dfrac{1}{2}$
40	$\dfrac{2}{3}$
135	$2\dfrac{1}{4}$ = 60 + 60 + 15

[2]

9. Write 180 g as a fraction of 3 kg ← 3000g

Give your answer in its simplest form.

$\dfrac{180}{3000} = \overset{\div 6}{\dfrac{18}{300}} = \dfrac{3}{50}$

[2]

10. Work out $2\dfrac{3}{4} \times 1\dfrac{5}{7}$ $\dfrac{11}{4} \times \dfrac{12}{7}$

Give your answer as a mixed number in its simplest form.

$\dfrac{11 \times 12}{4 \times 7} = \dfrac{132}{28} = 4\dfrac{20}{28} = 4\dfrac{10}{14} = 4\dfrac{5}{7}$

28 + 28 = 56 $\dfrac{132}{112}$
56 + 56 = 112 $\dfrac{20}{20}$

[3]

11. Write 0.037 as a fraction.

$3.7 = \frac{37}{10}$

$0.37 = \frac{37}{100}$

$$\frac{37}{1000}$$

[1]

12. There are only black pens and green pens in a box.

The ratio of the number of black pens in the box to the number of green pens in the box is 2 : 5

What fraction of the pens are black?

B G
2 : 5

$$\frac{2}{7}$$

.... [1]

13. Sam buys 20 boxes of oranges.

Total oranges = 20 × 25 = 500

There are 25 oranges in each box.

(20) Each boxes of oranges costs £7 Cost = 20 × 7 = £140

Sam sells $\frac{2}{5}$ of the oranges he bought.

He sells each of these oranges for 40p.

He then sells each of the remaining oranges at 3 oranges for 50p.

Did Sam make a profit or did Sam make a loss?

You must show working to justify your answer.

Sells $\frac{2}{5}$ of 500 = 200 × 0.40 = £80

The rest 500 - 200 = 300
3 oranges for 50p   100 × 0.5 = £50
                                        £130

Sam made a loss (140 - 130 = £10)

[5]

14. (a) Work out $\frac{2}{7} + \frac{1}{5}$

$\times 5 \left(\frac{10}{35} + \frac{7}{35} \right) \times 7$

$\frac{17}{35}$

....

[2]

(b) Work out $1\frac{2}{3} \div \frac{3}{4}$

$\frac{5}{3} \div \frac{3}{4}$

$\frac{5}{3} \times \frac{4}{3}$

$\frac{20}{9}$

....

[2]

15. ABCD is a square.

$\frac{1}{32}$

$\frac{1}{64}$

$\frac{1}{4}$

$\frac{1}{16} \leftrightarrow \frac{1}{8}$

$\frac{11}{64}$ not shaded

$\frac{1}{2}$
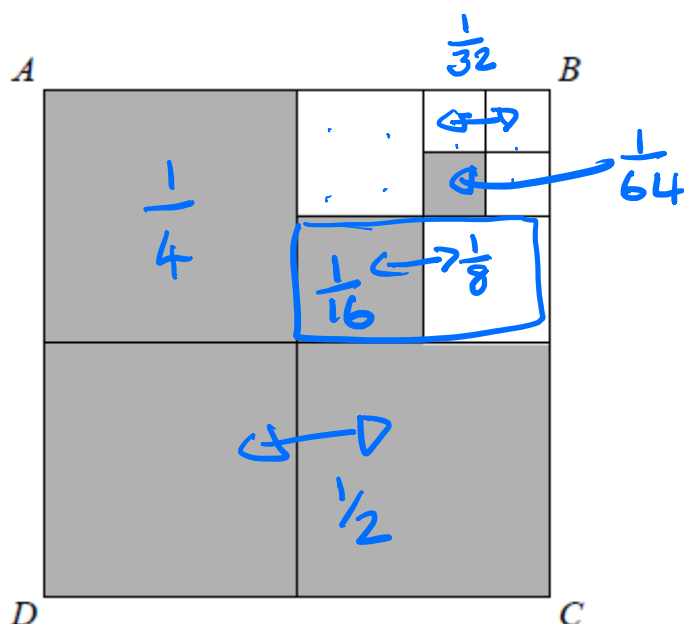
This diagram is drawn accurately.

What fraction of the square ABCD is shaded?

$\frac{1}{2} + \frac{1}{4} + \frac{1}{16} + \frac{1}{64}$

$\frac{32}{64} + \frac{16}{64} + \frac{4}{64} + \frac{1}{64} = \frac{53}{64}$

.... [2]

16. There are 25 boys and 32 girls in a club.

$\frac{1}{5}$ of 25 = 5

$\frac{2}{5}$ of the boys and $\frac{2}{5}$ of 25 = 10

$\frac{1}{2}$ of 32 = 16

$\frac{1}{2}$ of the girls walk to the club. = 16

26

The club leader picks at random a child from the children who walk to the club.

Work out the probability that this child is a boy.

$\frac{10}{26} = \frac{5}{13}$

.... [3]

17. Here are five fractions.

+2   ÷10   ÷4   ÷20

$\frac{2}{8}$ $\frac{10}{40}$ $\frac{12}{48}$ $\boxed{\frac{5}{24}}$ $\frac{20}{80}$

One of these fractions is not equivalent to $\frac{1}{4}$

(a) Write down this fraction.

$\frac{5}{24}$

.... [1]

(b) Work out $\frac{2}{7} + \frac{1}{14}$

×2 $\frac{4}{14} + \frac{1}{14}$

$\frac{5}{14}$

.... [2]

(c) Work out $\frac{4}{5} \div \frac{3}{10}$

$\frac{4}{5} \times \frac{10}{3} = \frac{40}{15}$

Give your answer in its simplest form.

$= \frac{8}{3}$

$2\frac{2}{3}$

.... [2]

18.

Living to 100 years old

1 in 3 babies born last year
are expected to live
to 100 years old

1 in 3 means $\frac{1}{3}$

720 000 babies were born last year.

$$\frac{240\,000}{3\,\overline{)720\,000}}$$

How many of these babies are expected to live to 100 years old?

$\frac{1}{3}$ of 720,000 $= \frac{720000}{3}$

.... 240,000 .... [2]

19. There are 35 pens in a box.

15 of the pens are green.

The rest of the pens are red.

What fraction of the pens in the box are red?

G   R
15   20 ← 35-15

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

.... [1]

20. 120 men and 80 women were asked if they drive to work.

Altogether $\frac{1}{4}$ of the people said yes.

$\frac{1}{3}$ of the men said yes.

What fraction of the women said yes?

	m	w	total
asked	120	80	200

YES $\frac{1}{3}$ of 120

40

$\frac{1}{4}$ of 200

so 10 women said yes.   = 50

fraction $= \frac{10}{80} = \frac{1}{8}$

[4]

21. In Scotland, squirrels are red or grey in the ratio red : grey = 1 : 2 $\frac{1}{2}$

R G

What fraction of the squirrels in Scotland are red?

$\frac{1}{3 \cdot 5} = \frac{10}{35}$ $\frac{2}{7}$

×10   ÷5

[2]

22. There are 20 students.

12 are boys.

$\frac{12}{20} = \frac{6}{10} = \frac{3}{5}$

What fraction are boys? Circle your answer.

[1]

$\frac{2}{3}$ ✗ $\frac{2}{5}$ ✗ $\left(\frac{3}{5}\right)$ $\frac{3}{4}$ ✗

23. Which of $\frac{2}{5}$ or $\frac{5}{8}$ is closer in value to $\frac{1}{2}$? $= \frac{20}{40}$

You must show your working.

$\frac{2}{5} \searrow \frac{16}{40}$ $\frac{5}{8} \searrow \frac{25}{40}$ $\frac{16}{40}$ is closed to $\frac{20}{40}$ $\therefore \boxed{\frac{2}{5}}$

$\times 8$ $\times 5$

[3]

24. A drink is mixed in the ratio

              L   O   C

         lemonade : orange : cranberry = 6 : 3 : 2   11

What fraction is orange? $\frac{3}{11}$

Circle your answer.

[1]

$\frac{3}{8}$ $\frac{2}{11}$ $\boxed{\frac{3}{11}}$ $\frac{6}{11}$

25. Jody's pay is £315 per week.

She works for $37\frac{1}{2}$

Work out her hourly rate of pay.

$315 \div 37.5 \quad = \quad £8.40$

[2]

26. What is one quarter of 5 hours? $5 \times 60 = 300$ $300 \div 5 = 75\,mins$

Tick a box.

1 hour 15 minutes $75\,mins$ ✓
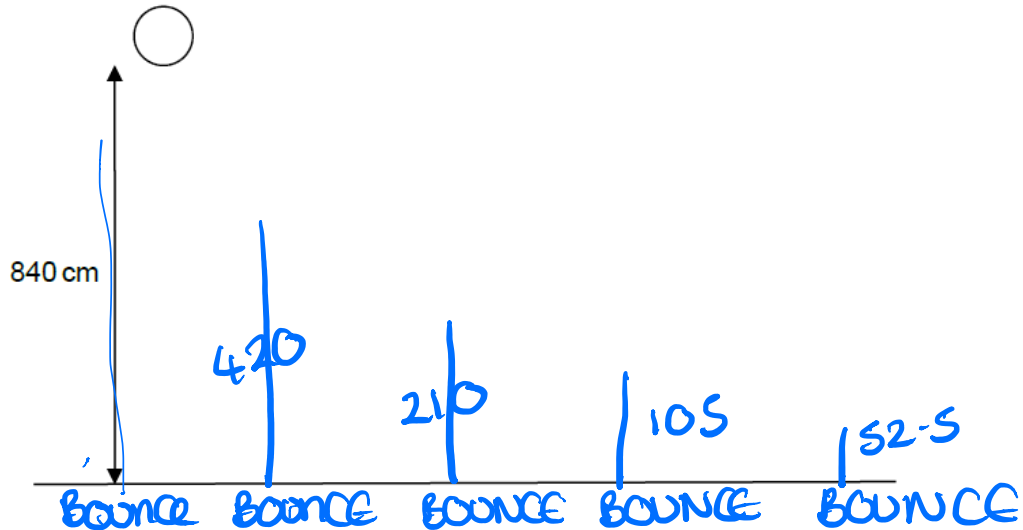
115 minutes $1hr\,55mins$ ☐

1 hour 25 minutes   ☐

125 minutes   ☐

[1]

27. A ball is dropped from a height of 840 cm onto a floor.

840 cm

420   210   105   52·5

BOUNCE BOUNCE BOUNCE BOUNCE BOUNCE

After each bounce it rises to a height that is half of the distance it has just fallen.

After how many bounces will the ball fail to reach a height of 1m for the first time?

You must show all your working.

$\therefore$ 5 bounces

[3]

28. In a school, $\frac{3}{5}$ of the pupils are girls.

$\frac{3}{5} = 390$ $\frac{1}{5} = 130$

There are 390 girls in the school.

Calculate the total number of pupils in the school.

$\therefore \frac{5}{5}$ ie 1 whole $= 130 \times 5$
$= 650$

[3]

29. Faizal has £400. ✓

He spends $\frac{1}{4}$ of it on rent and $\frac{2}{5}$ of it on food.

What fraction does he have left?

Write your answer in its simplest terms.

Rent   Food
£100 $\frac{1}{5} = 80$
           $\frac{2}{5} = 160$

Total = 260
Left = 140

as a fraction $\frac{140}{400} = \frac{14}{40} = \frac{7}{20}$

[4]

30. One sheet of A3 card has area $\frac{1}{8}$ m²

$\frac{1}{8}$ of 160 g = 20g per sheet

The card has a mass of 160 g per m²

Work out the total mass of 25 sheets of A3 card

$25 \times 20g = $ 500g

[4]

31. How many minutes are there in $3\frac{1}{4}$ hours?

$3 \times 60 = 180$
$+15$
_____
195

................195................ minutes [1]

32. Here are four fractions.

$\frac{1}{2}$ $\frac{12}{24}$ $\frac{17}{24}$ $\frac{3}{4}$ $\frac{18}{24}$ $\frac{5}{12}$ $\frac{10}{24}$

✓

$\frac{3}{4}$: ×6 $\frac{5}{12}$: ×2

Write these fractions in order of size.

Start with the smallest fraction.

$\frac{5}{12}$ $\frac{1}{2}$ $\frac{17}{24}$ $\frac{18}{24}$

[2]

33. Work out $\frac{4}{5}$ of 210 cm.

$\frac{1}{5} = 42$ $\frac{4}{5} = $

................168................ cm [1]

34. Lethna worked out $\frac{2}{5} + \frac{1}{2}$

$\frac{4}{10} + \frac{5}{10} = \frac{9}{10}$

She wrote:

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

The answer of $\frac{3}{10}$ is wrong.

(a) Describe one mistake that Lethna made.

She hasn't adjusted the numerators when finding the common denominator of 10

[1]

Dave worked out $1\frac{1}{2} \times 5\frac{1}{3}$ $\frac{3}{2} \times \frac{16}{3} = \frac{48}{6} = 8$

He wrote:

$$1 \times 5 = 5 \text{ and } \frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$$

$$so\ 1\frac{1}{2} \times 5\frac{1}{3} = 5\frac{1}{6}$$

The answer of $5\frac{1}{6}$ is wrong.

(b) Describe one mistake that Dave made.

its better to convert mixed number fractions to top heavy fractions.

[1]

35. Work out $\frac{3}{5}$ of 200

$\frac{1}{5} = 40$ $\frac{3}{5} = 120$

[2]

36. Here are two piles of the same type of paper.

Each sheet of paper is $\frac{7}{1000}$ cm thick.

The taller pile is $10\frac{1}{2}$ cm high.

number of sheets
= 10·5 ÷ $\frac{7}{1000}$
= 1500 sheets

$10\frac{1}{2}$ cm

$(10·5 ÷ 3) \times 2$
= 7cm

3   :   2

height of taller pile : height of shorter pile = 3 : 2

Work out the number of sheets of paper in the shorter pile.

1500 ÷ 3 = 500   500 × 2 = 1000 sheets

[3]

37. In a class, the number of girls as a fraction of the number of boys is $\frac{5}{4}$ $\frac{girls.}{boys.}$

a) Write down the number of boys as a fraction of the number of girls.

$$\frac{boys}{girls} \qquad \frac{4}{5}$$

[1]

b) There are 20 girls in the class. Work out the number of boys.

20 girls

$$\frac{girls}{boys} = \frac{5}{4} = \frac{20}{?}$$

× 4

× 4

[2]

boys = 16