MS REY

11c

edexcel

GCSE Mathematics Practice Tests: Set 3

Paper 1F (Non-calculator)

Time: 1 hour 30 minutes

You should have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser.

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need*.
- **Calculators must not be used.**
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must **show all your working out.**

Information

- The total mark for this paper is 80
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Ordering Fractions

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1.   Mr Jones gave four of his students a test.
     The total number of marks for the test is 80

     Jamie got $\frac{1}{2}$ of the marks.

     Andy got $\frac{2}{5}$ of the marks.

     Robbie got $\frac{3}{4}$ of the marks.

     Davy got $\frac{3}{5}$ of the marks.

     LCM of 2, 5 and 4 = 20

     Write the fractions in order of size.
     Start with the smallest fraction.

     $\frac{1}{2} = \frac{10}{20}$

     $\frac{2}{5} = \frac{8}{20}$

     $\frac{3}{4} = \frac{15}{20}$

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

     $\therefore \quad \frac{8}{20}, \frac{10}{20}, \frac{12}{20}, \frac{15}{20}$

     $\Rightarrow \quad \frac{2}{5}, \frac{1}{2}, \frac{3}{5}, \frac{3}{4}$

     ....

     (Total 3 mark)

2. Graham has £10
   He wants to buy as many pencils as he can.
   Each pencil costs 80 pence.

   How many pencils can Graham buy?

   $£10 \div £0.80$

   $= £100 \div £8$

   $$8\overline{)100.^{2}0^{4}0} = 0125$$

   $\therefore$ 12.5 pencils

   $\Rightarrow$ must be a whole number!

   12

   (Total 3 mark)

---

3. (a) Simplify $m + m + m + m$

   1 lot + 1 lot + 1 lot + 1 lot = 4 lots

   4m

   (1)

   (b) Simplify $5a - 2a$

   5 lots − 2 lots

   3a

   (1)

   (c) Simplify $x \times y \times 4$

   4xy

   4xy

   (1)

   (Total 3 mark)

---

4. (a) Write the number 4117 in words.

   Four thousand one hundred and seventeen

   (1)

   (b) Write the number 4117 to the nearest hundred.

   1 rounds down!

   = 4100
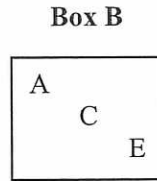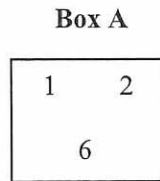
   4100

   (1)

   (Total 2 mark)

---

5. David takes, at random, a number from Box A.
He then takes, at random, a letter from Box B.

Box A

1	2
6	

Box B

A	
	C
	E

(*a*) List all the possible outcomes he could get.

(1,A), (1,C), (1,E), (2,A), (2,C), (2,E),

(6,A), (6,C), (6,E)

(2)

(*b*) Find the probability that David takes the number 2 and the letter E.

"1 out of 9" = $\frac{1}{9}$

$\frac{1}{9}$

(2)

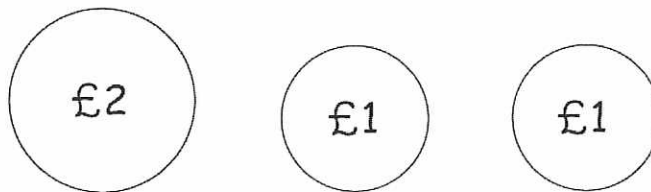**(Total 4 marks)**

6. An ice cream van has this price list.

Price List	
Choc Ice	£1.25
Tub	£1.15
Cone	85p

Mitch only has these three coins.
He has no other money.

£2   £1   £1

Mitch wants to buy a choc ice, a tub and 2 cones.

Has Mitch got enough money?
You must show your working.

Total money: £2 + £1 + £1 = £4

Total cost :   £1.25 + £1.15 + 2 × £0.85 =   1.25
(2 × £0.85 = £1.70)   1.15 (+)
                                                   1.70
                                                   ———
                                                   £4.10

Conclusion   No since £4.10 > £4

(Total 3 marks)

7. Jack and Max share some counters.

    Jack has 3 times as many counters as Max.

    Jack : 3x
    Max : x

    (a) Write down the ratio of the number of counters Jack has to the number of counters Max has.

    Jack : Max
    3x : x
    3 : 1

    .... $3:1$

    (1)

    (b) What fraction of the counters does Max have?

    "1 out of 4."

    .... $\dfrac{1}{4}$

    (1)

    Sunil has 40 counters.

    9 of Sunil's counters are red.

    Not Probability

    (c) What fraction of Sunil's counters are **not** red?

    $P(Red) = \dfrac{9}{40}$

    Sum of all probabilities = 1

    $\left(-\dfrac{9}{40}\right)$

    $\dfrac{9}{40} + P(NOT\ RED) = 1$

    $P(NOT\ RED) = \dfrac{31}{40}$

    .... $\dfrac{31}{40}$

    (1)

    (Total 3 marks)

8. Which is bigger $\frac{2}{5}$ or 0.6?

Justify your answer.

Convert $\frac{(\times 2)}{(\times 2)}$ | $\frac{2}{5} = \frac{4}{10}$

To Decimal | $= \underline{\underline{0.4}}$

Conclusion | $0.4 < 0.6$

$\therefore \frac{2}{5} < 0.6$ $\underline{\underline{0.6 \text{ is bigger}}}$

(Total 3 marks)

9. A bag contains only red counters and blue counters.
There are 4 red counters in the bag.

The probability of taking a blue counter is the same as the probability of taking a red counter.

(a) How many blue counters are there in the bag?

.... **4** ....

(1)

In another bag there are 14 counters.
The bag contains only red counters, blue counters and yellow counters. 4 of the counters are red.

The probability of taking a blue counter is twice the probability of taking a red counter.

(b) How many yellow counters are there in the bag?

$P(blue) = 2 \times P(red)$

Red = 4 counters

Total = 14 counters

(-12)

∴ Twice as many blue counters as red

$2 \times 4 = 8$ blue counters

14 = Red + Blue + Yellow

14 = 4 + 8 + ... Yellow

2 = Yellow **(3)**

(Total 4 marks)

10.
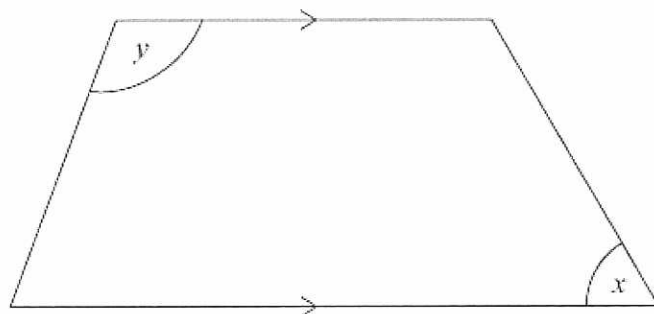
(a) Write down the special name for this quadrilateral.

2D-Shape Properties

.... Trapezium ....

(1)

(b) Measure the size of the angle marked *x*.   *Measuring Angles*

.... 60 °

(1)

(c) Write down the special name for the angle marked *y*.

Between 90° and 180° ∴ obtuse   .... obtuse ....

(1)

(Total 3 marks)

11. Here is part of a bus timetable from Harrow Lane to Cartbridge Street.

Harrow Lane to Cartbridge Street

Harrow Lane	08 02 ✓	09 04	10 12	11 02	12 04	12 12
Elm Drive	08 19	09 21	10 29	11 19	12 21	12 29
Hamden Road	08 32	09 34	10 42	11 32	12 34	12 42
Swipe Crescent	08 41	09 43	10 51	11 41	12 43	12 51
Cartbridge Street	08 50	09 52	11 01	11 50	12 52	13 01

A bus goes from Harrow Lane to Cartbridge Street.
The bus leaves Harrow Lane at 08 02

(a) At what time should the bus get to Cartbridge Street?

O8 : 5O

(1)

Here is part of a bus timetable from Cartbridge Street to Harrow Lane.

Cartbridge Street to Harrow Lane

Cartbridge Street	13 11	14 14	15 07	16 11	17 14	18 07
Swipe Crescent	13 20	14 24	15 16	16 20	17 24	18 16
Hamden Road	13 29	14 33	15 25	16 29	17 33	18 25
Elm Drive	13 43	14 47	15 39	16 43	17 47	18 39
Harrow Lane	13 53	14 57	15 49	16 53	17 57	18 49

A bus goes from Cartbridge Street to Harrow Lane.
This bus leaves Hamden Road at 13 29

(b) Work out how many minutes this bus should take to go from Hamden Road to Elm Drive.

Hamden Road = 13:29
Elm Drive = 13:43

Difference = 14 minutes

14

(1)

Peter lives in Harrow Lane.
His grandmother lives in Swipe Crescent.

Peter visits his grandmother.
He goes by bus from Harrow Lane to Swipe Crescent.

Peter wants to have at least 3 hours with his grandmother.
He needs to be back at Harrow Lane by 16 00

(c) Plan Peter's journey to visit his grandmother and get back to Harrow Lane.
You must include the times of the buses.

NOTE: LOTS OF CORRECT ANSWERS!

Work backwards...

Must be back at Harrow by 16:00

∴ must leave Swipe Crescent by 15:16

3 hours with Grandmother

15:16 - 3 hours = 12:16

∴ must be at swipe crescent for 12:16

∴ should leave Harrow at either:

08:02, 09:04, 10:12 or 11:02

(4)

(Total 6 marks)

Speed, Distance, Time

12. On Monday Ravi drives for 4 hours.
His average speed is 30 mph.

(a) How far does Ravi drive on Monday?

$S = \dfrac{D}{T}$

$\therefore D = S \times T$

$S = 30\text{mph}, \quad T = 4\text{hours}$

$D = 30\text{mph} \times 4\text{hours} = 120\text{miles}$

....120.. miles

(2)

On Tuesday Ravi drives 200 km.

5 miles = 8 kilometres.

(b) On which day did Ravi drive further?

$200 \div 8 = 8\overline{)200}^{\,025}$

Conclusion

5miles = 8km

$\times 25 \Big\downarrow$

125miles = 200km

$\uparrow \div 25$

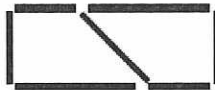125 miles > 120 miles $\therefore$ Further on Tuesday.

(3)

(Total 5 marks)

13. Here are some patterns made from sticks.

Pattern number 1   Pattern number 2   Pattern number 3

(a) Draw Pattern number 4

(1)

(b) Complete the table

Pattern number		Number of sticks	
1	$\times 3 + 1$ $\longrightarrow$	4	
2	$\times 3 + 1$ $\longrightarrow$	7	+3
3	$\times 3 + 1$ $\longrightarrow$	10	+3
4	$\times 3 + 1$ $\longrightarrow$	13	+3
10	$\times 3 + 1$ $\longrightarrow$	31	
25	$(\div 3) - 1$ $\longleftarrow$	76	

$10 \times 3 = 30$
$30 + 1 = 31$
$76 - 1 = 75$
$75 \div 3 = 25$

(3)

*n*th term sequences

(c) Find an expression, in terms of *n*, for the number of sticks needed for Pattern number *n*.

$\overset{-3}{\underset{\longleftarrow}{①}}$ $4, 7, 10, 13$
    $\underset{+3}{\longrightarrow} \underset{+3}{\longrightarrow} \underset{+3}{\longrightarrow}$

$\therefore n\text{th term} = \underline{3n+1}$

....

(2)

(Total 6 marks)

14. Buses to Acton leave a bus station every 24 minutes.
Buses to Barton leave the same bus station every 20 minutes.

A bus to Acton and a bus to Barton both leave the bus station at 9 00 am.

When will a bus to Acton and a bus to Barton next leave the bus station at the same time?

LCM of 20 and 24

24, 48, 72, 96, 120
20, 40, 60, 80, 100, 120

∴ Buses Leave together every 2 hours (120 minutes)

9:00 am + 2 hours = 11:00 am

.... 11:00am ....
(Total 3 marks)

15. (*a*) Expand and simplify $2(x + 3y) + 4(x - y)$

Expanding and Simplifying

Expand $= 2x + 6y + 4x - 4y$

collect $= 6x + 2y$

.... $6x + 2y$ ....
(2)

(*b*) Factorise completely $8p - 12pq$

Factorising

4 is a factor $4(2p - 3pq)$

p is a factor $4p(2 - 3q)$

.... $4p(2 - 3q)$ ....
(2)

(Total 4 marks)

16. (*a*) Find the Highest Common Factor (HCF) of 30 and 42.

$$\begin{array}{c}5\\10\\15\\30\end{array}\Big/30 \qquad \begin{array}{c}6\\3\\2\\1\end{array} \qquad \begin{array}{c}7\\14\\21\\42\end{array}\Big/42 \qquad \begin{array}{c}6\\3\\2\\1\end{array}$$
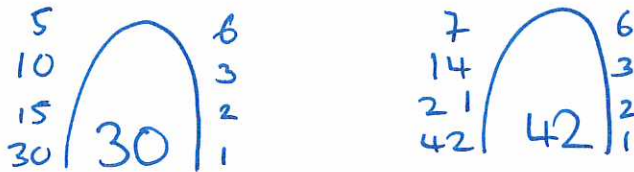
∴ HCF = 6

6 ....

(2)

(*b*) Find the Lowest Common Multiple (LCM) of 30 and 45. LCM

30, 60, 90
45, 90
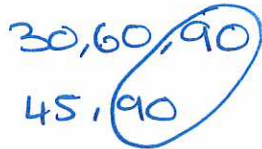
90 ....
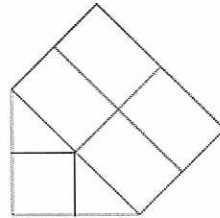
(2)

(Total 4 marks)

17. Here is a prism.
It is made by cutting a solid cube of side 2 cm in half.

3D Shape Volume

Cube volume
(= L×L×L)

$V = L \times L \times L$
$= 2 \times 2 \times 2$
$= 8\,cm^3$

Prism = ½ cube

$V = \frac{1}{2} \times 8\,cm^3$
$= 4\,cm^3$

Find the volume of the prism.

$4\,cm^3$ ....

(Total 3 marks)

3. Here are the ingredients needed to make **8** shortbread biscuits.

> Shortbread biscuits
> makes **8** biscuits
> 120 g butter
> 60 g caster sugar
> 180 g flour

Tariq is going to make some shortbread biscuits.
He has the following ingredients

330 g butter   200 g caster sugar   450 g flour

Work out the greatest number of shortbread biscuits that Tariq can make with his ingredients.
You must show all your working.

UNITARY

How much ingredient needed for 1 biscuit?

$8\overline{)60.0}$ = 7.5

Butter:	$120g \div 8 = 15g$
Caster:	$60g \div 8 = 7.5g$
Flour:	$180g \div 8 = 22.5g$

$8\overline{)180.0}$ = 022.5

Could we make 10?

Butter: $15g \times 10 = 150g$ ✓
Caster: $7.5g \times 10 = 75g$ ✓   YES
Flour: $22.5g \times 10 = 225g$ ✓

20?

Butter: 300g ✓
Caster: 150g ✓   YES
Flour: 450g ✓

.... biscuits

(Total 3 marks)

Conclusion

We have used all the flour

∴ maximum = 20 biscuits
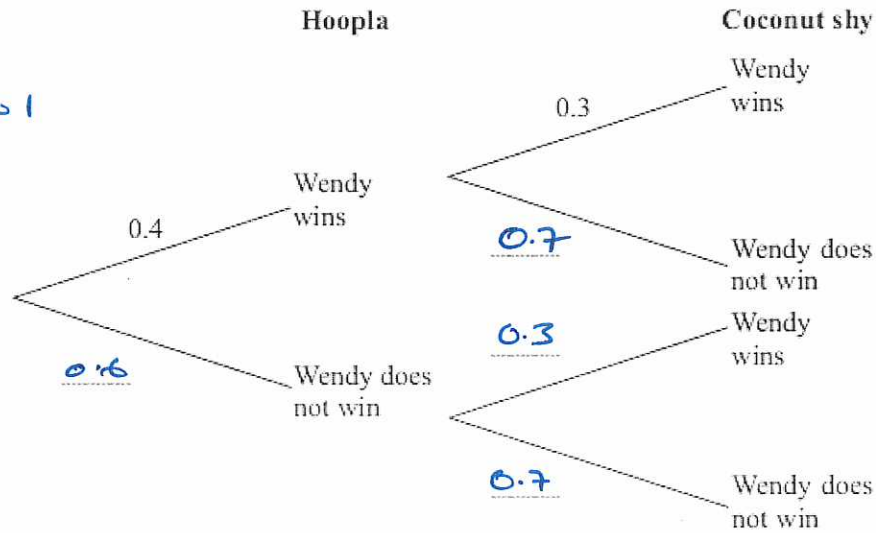
19. Wendy goes to a fun fair.
    She has one go at Hoopla.
    She has one go on the Coconut shy.

    The probability that she wins at Hoopla is 0.4
    The probability that she wins on the Coconut shy is 0.3

    (a) Complete the probability tree diagram.

	Hoopla	**Coconut shy**

Branches sum to 1

Wendy
wins
0.3

0.4   Wendy
       wins
              0.7   Wendy does
                         not win

              0.3   Wendy
                         wins

0·6   Wendy does
           not win

              0.7   Wendy does
                         not win

(2)

(b) Work out the probability that Wendy wins at Hoopla <u>and</u> also wins on the Coconut shy.

$$P(\text{win, win}) = 0.4 \times 0.3$$
$$= 0.12$$

✗

.... 0·12 ....

(2)

(Total 4 marks)

4. Railtickets and Cheaptrains are two websites selling train tickets.

Each of the websites adds a credit card charge and a booking fee to the ticket price.

Railtickets

Credit card charge: 2.25% of ticket price

Booking fee: 80 pence

Cheaptrains

Credit card charge: 1.5% of ticket price

Booking fee: £1.90

Nadia wants to buy a train ticket.
The ticket price is £60 on each website.
Nadia will pay by credit card.

Will it be cheaper for Nadia to buy the train ticket from Railtickets or from Cheaptrains?

Railtickets

① credit charge

2.25% of £60

$1\% = £0.60$
$0.5\% = £0.30$
$0.25\% = £0.15$ ⊕
$2\% = £1.20$

$\therefore 2.25\% = £1.35$

② Booking fee
fee = £0.80

Total = £1.35 + £0.80
= £2.15

$\therefore$ It is cheaper for Nadia to buy from railtickets

Cheaptrain's

① Credit charge

1.5% of £60
$1\% = £0.60$ ⊕
$0.5\% = £0.30$
$\therefore 1.5\% = £0.90$

② Booking fee
fee = £1.90

Total = £1.90 + £0.90
= £2.80

(Total 4 marks)

21. (a) Write 0.00385 in standard form.

(annotation: 3.85)
(annotation: 3 places)

$$3.85 \times 10^{-3}$$

(1)

(b) Write 7.291×10^5 as an ordinary number.

(annotation: 729100, 5 places ✓)

729100

(1)

(c) Work out $(2.4 \times 10^{10}) \div (6 \times 10^{-2})$
   Give your answer in standard form.

Split:

$a^m \div a^n = a^{m-n}$

Combine

Standard Form

$2.4 \div 6 = 0.4$

$10^{10} \div 10^{-2} = 10^{12}$
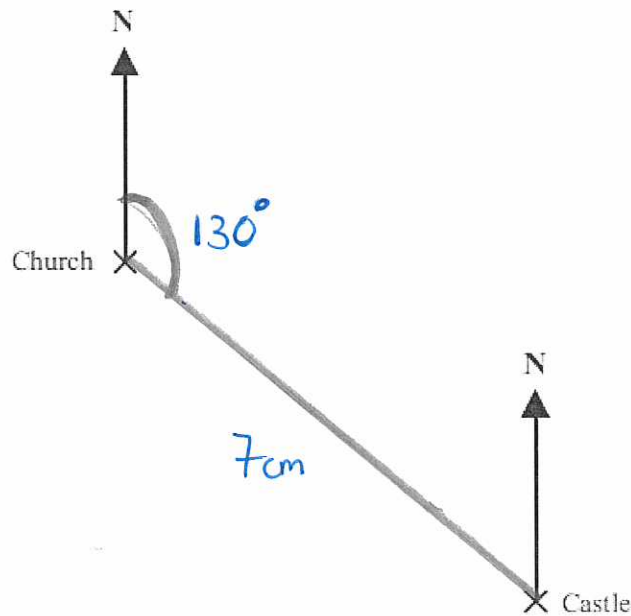
0.4×10^{12}

4×10^{11}

$6 \overline{)2.4}$ (quotient 0.4)

$$4 \times 10^{11}$$

(2)

(Total 4 marks)

22. The diagram shows part of a map.
It shows the positions of a castle and a church.

N

Church ✕ 130°

7cm

N

✕ Castle

The scale of the map is 1:10 000

(a) Work out the real distance between the castle and the church.
Give your answer in metres.

Scale Ratio

Model : Real
1 cm : 10000 cm

(×7)   7 cm : 70000 cm

Convert to m (÷100)   70000 cm ÷ 100 = 700 m

.................700....... m

(2)

(b) Find the bearing of the castle from the church.

USE A PROTRACTOR

.................130...... °

(1)

(Total 3 marks)

TOTAL FOR PAPER IS 80 MARKS