

IGCSE Cambridge Topical Past Papers

# MATHEMATICS 9-1

0980 Paper 2

2020 — 2025

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1 - (0980/22\_Summer\_2020\_Q2)

At noon the temperature in Maseru was  $21^{\circ}\text{C}$ .  
At midnight the temperature had fallen by  $26^{\circ}\text{C}$ .

Work out the temperature at midnight.

.....  $^{\circ}\text{C}$  [1]

2 - (0980/22\_Summer\_2020\_Q4)

Write down

(a) a square number greater than 10,

..... [1]

(b) an irrational number.

..... [1]

3 - (0980/22\_Summer\_2020\_Q8)

Write  $2^{-4}$  as a decimal.

..... [1]

4 - (0980/22\_Summer\_2020\_Q11)

**Without using a calculator**, work out  $1\frac{3}{4} - \frac{11}{12}$ .

You must show all your working and give your answer as a fraction in its simplest form.

..... [3]

5 - (0980/22\_Summer\_2020\_Q12)

Roberto buys a toy for \$5.00 .  
He then sells it for \$4.60 .

Calculate his percentage loss.

..... % [2]

6 - (0980/22\_Summer\_2020\_Q15)

Ella's height is 175 cm, correct to the nearest 5 cm.

Write down the upper bound of Ella's height.

..... cm [1]

7 - (0980/22\_Summer\_2020\_Q16)

Calculate  $(3 \times 10^{-3})^3$ .  
Give your answer in standard form.

..... [1]

8 - (0980/22\_Summer\_2020\_Q17)

A train of length 105 m takes 11 seconds to pass completely through a station of length 225 m.

Calculate the speed of the train in km/h.

..... km/h [3]

9 - (0980/21\_Winter\_2020\_Q3)

Rangan buys 3.6 kg of potatoes and 2.8 kg of leeks.  
The total cost is \$13.72.  
Leeks cost \$2.65 per kilogram.

Find the cost of 1 kg of potatoes.

..... [3]

10 - (0980/21\_Winter\_2020\_Q5)

$$T = \frac{49.2 - 9.59}{4.085 \times 2.35}$$

By writing each number correct to 1 significant figure, work out an estimate for  $T$ .  
You must show all your working.

..... [2]

11 - (0980/21\_Winter\_2020\_Q6)

**Without using a calculator**, work out  $2\frac{2}{3} \times 2\frac{3}{4}$ .

You must show all your working and give your answer as a mixed number in its simplest form.

..... [3]

12 - (0980/21\_Winter\_2020\_Q8)

(a) 1, 2, 3, 5 and 7 are all common factors of two numbers.

Write down the digit that the two numbers must end in.

..... [1]

(b) Write 84 as a product of its prime factors.

..... [2]

13 - (0980/21\_Winter\_2020\_Q9)

- (a) Ahmed increases 40 by 300%.

From this list, put a ring around the correct calculation.

$40 \times 1.300$

$40 \times 3$

$40 \times 400$

$40 \times 4$

$40 \times 300$

[1]

- (b) Ahmed finds the magnitude of the vector
- $\begin{pmatrix} 2 \\ -3 \end{pmatrix}$
- .

From this list, put a ring around the correct calculation.

$\sqrt{2^2 + -3^2}$

$2^2 - 3^2$

$\sqrt{2^2 - 3^2}$

$2^2 + (-3)^2$

$\sqrt{2^2 + (-3)^2}$

[1]

14 - (0980/21\_Winter\_2020\_Q10)

A town has a population of 45 000.

This population increases exponentially at a rate of 1.6% per year.

Find the population of the town at the end of 5 years.

Give your answer correct to the nearest hundred.

..... [3]

15 - (0980/21\_Winter\_2020\_Q13)

Write the recurring decimal  $0.1\dot{7}$  as a fraction in its simplest form.

You must show all your working.

..... [3]

16 - (0980/22\_Summer\_2021\_Q2)

Calculate  $\sqrt[4]{0.0256}$ .

..... [1]

17 - (0980/22\_Summer\_2021\_Q7)

(a) Complete these statements.

The reciprocal of 0.2 is .....

A prime number between 90 and 100 is ..... [2]

(b)  $\frac{7}{5}$     0.6     $\sqrt{7}$     8     $\sqrt{9}$

From this list, write down an irrational number.

..... [1]

18 - (0980/22\_Summer\_2021\_Q9)

**Without using a calculator**, work out  $\frac{2}{3} \div 1\frac{3}{7}$ .

You must show all your working and give your answer as a fraction in its simplest form.

..... [3]

19 - (0980/22\_Summer\_2021\_Q10)

(a) Write 0.00654 in standard form.

..... [1]

(b) The number  $1.467 \times 10^{102}$  is written as an ordinary number.

Write down the number of zeros that follow the digit 7.

..... [1]

20 - (0980/22\_Summer\_2021\_Q11)

Write  $0.\dot{0}\dot{4}$  as a fraction in its simplest form.

..... [1]

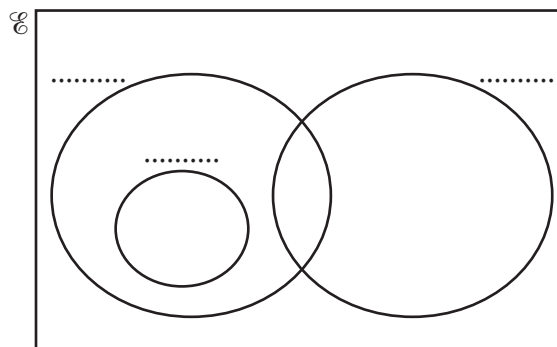
21 - (0980/22\_Summer\_2021\_Q12)

- (a)  $\mathcal{E} = \{\text{integers greater than 2}\}$   
 $A = \{\text{prime numbers}\}$   
 $B = \{\text{odd numbers}\}$   
 $C = \{\text{square numbers}\}$

(i) Describe the type of numbers in the set  $B' \cap C$ .

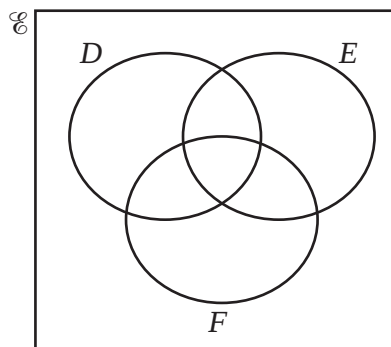
..... [1]

(ii) Complete the set labels on the Venn diagram.



[1]

(b)



Shade the region  $D' \cup (E \cap F)'$

[1]

22 - (0980/21\_Winter\_2021\_Q1)

- $P$  is a prime number where  $60 < P < 80$ .  
 $P$  is 2 less than a square number.

Find the value of  $P$ .

$P =$  ..... [2]

23 - (0980/21\_Winter\_2021\_Q2)

Hank flies from Los Angeles to Shanghai.

- (a) The flight departs on Friday 22 July at 21 40.  
The flight takes 13 hours 35 minutes.  
The local time in Shanghai is 15 hours ahead of the local time in Los Angeles.

Find the day, date and time in Shanghai when Hank's flight arrives.

Day ....., Date ....., Time ..... [3]

- (b) The cost of the flight is \$920.  
The exchange rate is \$1 = 6.87 Chinese yuan.

Find the cost of the flight in yuan.

..... yuan [1]

24 - (0980/21\_Winter\_2021\_Q3)

Calculate.

$$\frac{4.87 - 2.7}{-0.2 + \sqrt[3]{0.729}}$$

..... [1]

25 - (0980/21\_Winter\_2021\_Q7)

**Without using a calculator**, work out  $1\frac{5}{6} + \frac{2}{5}$ .

You must show all your working and give your answer as a mixed number in its simplest form.

..... [3]

26 - (0980/21\_Winter\_2021\_Q12)

Chai invests some money.

By the end of the first year, the value of the investment has decreased by 35%.

By the end of the second year, the value of the investment has increased by 40% of its value at the end of the first year.

Find the overall percentage change in the value of the investment.

..... % [3]

27 - (0980/22\_Summer\_2022\_Q1 )

At noon, the temperature is  $4^{\circ}\text{C}$ .

At midnight, the temperature is  $-9^{\circ}\text{C}$ .

Work out the difference in temperature between noon and midnight.

.....  $^{\circ}\text{C}$  [1]

28 - (0980/22\_Summer\_2022\_Q2 )

Thibault records the number of cars of each colour in a car park.

| Colour         | Black | White | Silver | Red |
|----------------|-------|-------|--------|-----|
| Number of cars | 8     | 5     | 4      | 3   |

He draws a pie chart to show this information.

Calculate the sector angle for the red cars.

..... [2]

29 - (0980/22\_Summer\_2022\_Q3 )

Figs cost 43 cents each.

Lyra has \$5 to buy some figs.

Calculate the largest number of figs Lyra can buy and the amount of change, in cents, she receives.

..... figs and ..... cents change [3]

30 - (0980/22\_Summer\_2022\_Q4 )

Find the value of  $\sqrt{68} \times \sqrt{153}$ .

..... [1]

31 - (0980/22\_Summer\_2022\_Q7 )

The price of a coat is \$126.

In a sale, this price is reduced by 18%.

Find the sale price of the coat.

\$..... [2]

1 - (0980/22\_Summer\_2020\_Q2)

|  |    |   |  |
|--|----|---|--|
|  | -5 | 1 |  |
|--|----|---|--|

2 - (0980/22\_Summer\_2020\_Q4)

|     |                                   |   |  |
|-----|-----------------------------------|---|--|
| (a) | Any square number greater than 10 | 1 |  |
| (b) | Any irrational number             | 1 |  |

3 - (0980/22\_Summer\_2020\_Q8)

|  |        |   |  |
|--|--------|---|--|
|  | 0.0625 | 1 |  |
|--|--------|---|--|

4 - (0980/22\_Summer\_2020\_Q11)

|  |                 |                    |           |  |
|--|-----------------|--------------------|-----------|--|
|  | $\frac{7}{4}$   | $\frac{9}{12}$     | <b>B1</b> |  |
|  | $\frac{21}{12}$ | $1 - \frac{2}{12}$ | <b>M1</b> |  |
|  | $\frac{5}{6}$   | $\frac{5}{6}$      | <b>A1</b> |  |

5 - (0980/22\_Summer\_2020\_Q12)

|  |   |   |                                                                              |
|--|---|---|------------------------------------------------------------------------------|
|  | 8 | 2 | <b>M1</b> for $\frac{5-4.60}{5} [\times 100]$ or $\frac{4.60}{5} \times 100$ |
|--|---|---|------------------------------------------------------------------------------|

6 - (0980/22\_Summer\_2020\_Q15)

|  |       |   |  |
|--|-------|---|--|
|  | 177.5 | 1 |  |
|--|-------|---|--|

7 - (0980/22\_Summer\_2020\_Q16)

|  |                      |          |  |
|--|----------------------|----------|--|
|  | $2.7 \times 10^{-8}$ | <b>1</b> |  |
|--|----------------------|----------|--|

8 - (0980/22\_Summer\_2020\_Q17)

|  |     |          |                                                                                                            |
|--|-----|----------|------------------------------------------------------------------------------------------------------------|
|  | 108 | <b>3</b> | <b>M1</b> for $(105 + 225) \div 11$<br><b>M1</b> for <i>their</i> speed $\times \frac{60 \times 60}{1000}$ |
|--|-----|----------|------------------------------------------------------------------------------------------------------------|

9 - (0980/21\_Winter\_2020\_Q3)

|  |      |          |                                                                                             |
|--|------|----------|---------------------------------------------------------------------------------------------|
|  | 1.75 | <b>3</b> | <b>M2</b> for $(13.72 - 2.8 \times 2.65) \div 3.6$ oe<br>or <b>M1</b> for $2.8 \times 2.65$ |
|--|------|----------|---------------------------------------------------------------------------------------------|

10 - (0980/21\_Winter\_2020\_Q5)

|  |                              |           |                                                                                                        |
|--|------------------------------|-----------|--------------------------------------------------------------------------------------------------------|
|  | $\frac{50 - 10}{4 \times 2}$ | <b>M1</b> | Allow <b>M1</b> for 3 out of 4 values correctly rounded or for all correct but with any trailing zeros |
|  | 5                            | <b>A1</b> | dep on $\frac{50 - 10}{4 \times 2}$                                                                    |

11 - (0980/21\_Winter\_2020\_Q6)

|  |                                                        |           |                                                                                                                  |
|--|--------------------------------------------------------|-----------|------------------------------------------------------------------------------------------------------------------|
|  | $\frac{8}{3}$ and $\frac{11}{4}$ oe improper fractions | <b>M1</b> |                                                                                                                  |
|  | $\frac{88}{12}$ oe improper fraction                   | <b>A1</b> |                                                                                                                  |
|  | $7 \frac{1}{3}$ cao final answer                       | <b>A1</b> | dep on 1 <sup>st</sup> A1<br>If M0 scored <b>SC1</b> for $\frac{8}{3}$ or $\frac{11}{4}$ oe<br>improper fraction |

12 - (0980/21\_Winter\_2020\_Q8)

|     |                                                           |   |                          |
|-----|-----------------------------------------------------------|---|--------------------------|
| (a) | 0                                                         | 1 |                          |
| (b) | $2^2 \times 3 \times 7$ or $2 \times 2 \times 3 \times 7$ | 2 | <b>B1</b> for 2, 2, 3, 7 |

13 - (0980/21\_Winter\_2020\_Q9)

|     |                       |   |  |
|-----|-----------------------|---|--|
| (a) | $40 \times 4$         | 1 |  |
| (b) | $\sqrt{2^2 + (-3)^2}$ | 1 |  |

14 - (0980/21\_Winter\_2020\_Q10)

|  |           |   |                                                                                                                                                                                                          |
|--|-----------|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 48700 cao | 3 | <b>M1</b> for $45000 \times \left(1 + \frac{1.6}{100}\right)^5$ oe<br><b>A1</b> for 48 710 to 48 720<br>If A0 scored <b>B1</b> for <i>their</i> more accurate value correctly rounded to the nearest 100 |
|--|-----------|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

15 - (0980/21\_Winter\_2020\_Q13)

|  |                               |           |                                       |
|--|-------------------------------|-----------|---------------------------------------|
|  | $17.77\ldots - 1.77\ldots$ oe | <b>M1</b> | <b>M1</b> for correct working shown   |
|  | $\frac{8}{45}$ cao            | <b>A2</b> | <b>B1</b> for $\frac{16}{90}$ oe seen |

16 - (0980/22\_Summer\_2021\_Q2)

|  |                      |   |  |
|--|----------------------|---|--|
|  | 0.4 or $\frac{2}{5}$ | 1 |  |
|--|----------------------|---|--|

17 - (0980/22\_Summer\_2021\_Q7)

|     |                |          |                    |
|-----|----------------|----------|--------------------|
| (a) | $\frac{5}{97}$ | <b>2</b> | <b>B1</b> for each |
| (b) | $\sqrt{7}$     | <b>1</b> |                    |

18 - (0980/22\_Summer\_2021\_Q9)

|  |                                                                                                       |           |                                                                                                     |
|--|-------------------------------------------------------------------------------------------------------|-----------|-----------------------------------------------------------------------------------------------------|
|  | $\frac{2}{3} \times \frac{7}{10}$ or<br>$\frac{14}{21} \div \frac{30}{21}$ oe with common denominator | <b>M2</b> | <b>B1</b> for $\frac{10}{7}$ oe<br>or <b>M1</b> for $\frac{2}{3} \times \text{their } \frac{7}{10}$ |
|  | $\frac{7}{15}$ cao                                                                                    | <b>A1</b> |                                                                                                     |

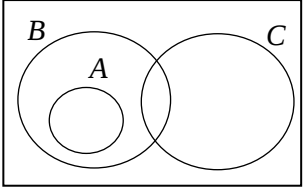
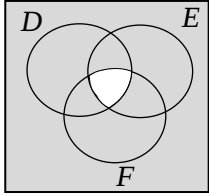
19 - (0980/22\_Summer\_2021\_Q10)

|     |                       |          |  |
|-----|-----------------------|----------|--|
| (a) | $6.54 \times 10^{-3}$ | <b>1</b> |  |
| (b) | 99                    | <b>1</b> |  |

20 - (0980/22\_Summer\_2021\_Q11)

|  |                    |          |  |
|--|--------------------|----------|--|
|  | $\frac{4}{99}$ cao | <b>1</b> |  |
|--|--------------------|----------|--|

21 - (0980/22\_Summer\_2021\_Q12)

|         |                                                                                   |   |  |
|---------|-----------------------------------------------------------------------------------|---|--|
| (a)(i)  | Even square numbers oe                                                            | 1 |  |
| (a)(ii) |  | 1 |  |
| (b)     |  | 1 |  |

22 - (0980/21\_Winter\_2021\_Q1)

|  |    |   |                                                                |
|--|----|---|----------------------------------------------------------------|
|  | 79 | 2 | <b>B1</b> for 64 or 81 seen or for answer 61, 62, 67, 71 or 73 |
|--|----|---|----------------------------------------------------------------|

23 - (0980/21\_Winter\_2021\_Q2)

|     |                        |   |                                                                                                                                                                                                                                                                                                                             |
|-----|------------------------|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (a) | Sunday 24 [July] 02 15 | 3 | <b>B1</b> for Sunday 24th [July] as final answer<br><b>B2</b> for 02 15 oe as final answer<br><br>or <b>B1</b> for sight of any of these 12 40 oe, 11 15 oe, 28h 35min, 50 15, 35 15<br><br>or 0215 oe spoilt<br><br>or <b>M1</b> for departure time + 13h35min + 15h evaluated as a time with one interval correctly added |
| (b) | 6320.4[0]              | 1 |                                                                                                                                                                                                                                                                                                                             |

24 - (0980/21\_Winter\_2021\_Q3)

|  |     |   |  |
|--|-----|---|--|
|  | 3.1 | 1 |  |
|--|-----|---|--|

25 - (0980/21\_Winter\_2021\_Q7)

|  |                                                           |           |                                                                       |
|--|-----------------------------------------------------------|-----------|-----------------------------------------------------------------------|
|  | $\frac{25 \text{ or } 55}{30} \text{ and } \frac{12}{30}$ | <b>M1</b> | Accept $\frac{25k \text{ or } 55k}{30k} \text{ and } \frac{12k}{30k}$ |
|  | $2\frac{7}{30} \text{ cao}$                               | <b>A2</b> | <b>A1</b> for $\frac{67k}{30k}$ or $1\frac{37k}{30k}$                 |

26 - (0980/21\_Winter\_2021\_Q12)

|  |          |          |                                                                                                                                                                                                                                                                                                                                                                            |
|--|----------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | $[- ] 9$ | <b>3</b> | <b>M2</b> for $[k \times ] \left(1 - \frac{35}{100}\right) \times \left(1 + \frac{40}{100}\right)$ oe or better<br><br>or for $[k \times ] \left(\frac{35}{100} - \left(1 - \frac{35}{100}\right) \times \frac{40}{100}\right)$<br><br>or <b>M1</b> for $[k \times ] \left(1 - \frac{35}{100}\right)$ oe<br><br>or $[k \times ] \left(1 + \frac{40}{100}\right)$ or better |
|--|----------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

27 - (0980/22\_Summer\_2022\_Q1)

|  |           |          |  |
|--|-----------|----------|--|
|  | 13 or -13 | <b>1</b> |  |
|--|-----------|----------|--|

28 - (0980/22\_Summer\_2022\_Q2)

|  |    |          |                                                                                     |
|--|----|----------|-------------------------------------------------------------------------------------|
|  | 54 | <b>2</b> | <b>M1</b> for $\frac{360}{8+5+4+3}[\times 3]$ or $\frac{3}{8+5+4+3}[\times 360]$ oe |
|--|----|----------|-------------------------------------------------------------------------------------|

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