MATHEMATICS

P4

2017 - 2023

QUESTIONS + ANSWERS

MATHEMATICS 0580

TOPICAL PAST PAPER WORKSHEETS

2017 - 2023 | Questions + Mark scheme

AVAILABLE PAPERS

P1	P2	P3	P4
977 Questions	987 Questions	391 Questions	443 Questions

TOPICS	P1	P2	P3	P4
Numbers	387	279	123	61
Algebra	135	222	49	62
Mensuration	52	46	40	46
Geometry	158	105	72	41
Trigonometry	37	61	25	55
Lines	23	28	13	17
Graphs	7	30	44	39
Sets	12	27	11	9
Vectors	28	29	6	16
Matrices	0	10	0	3
Transformation	5	15	40	31
Statistics	60	41	62	43
Probability	40	31	25	27
Functions	0	16	0	26
Linear Programming	0	14	0	6
Sequences	23	22	18	16
Differentiation	0	4	0	19

1 – (0580/41_Summer_2017_Q1) – *Percentages, Ratio And Proportion*

An energy company charged these prices in 2013.

Electricity price	Gas price
23.15 cents per day plus 13.5 cents for each unit used	24.5 cents per day plus 5.5 cents for each unit used

(a) **(i)** In 90 days, the Siddique family used 1885 units of **electricity**.

Calculate the total cost, in dollars, of the electricity they used.

$ ..... [2]

(ii) In 90 days, the **gas** used by the Khan family cost $198.16 .

Calculate the number of units of gas used.

..... units [3]

(b) In 2013, the price for each unit of electricity was 13.5 cents.
Over the next 3 years, this price increased exponentially at a rate of 8% per year.

Calculate the price for each unit of electricity after 3 years.

..... cents [2]

(c) Over these 3 years, the price for each unit of gas increased from 5.5 cents to 7.7 cents.

(i) Calculate the percentage increase from 5.5 cents to 7.7 cents.

..... % [3]

(ii) Over the 3 years, the 5.5 cents increased exponentially by the same percentage each year to 7.7 cents.

Calculate the percentage increase **each year**.

..... % [3]

(d) In 2015, the energy company divided its profits in the ratio

shareholders : bonuses : development = 5 : 2 : 6.

In 2015, its profits were $390 million.

Calculate the amount the company gave to shareholders.

$ ..... million [2]

(e) The share price of the company in June 2015 was $258.25 .
This was an increase of 3.3% on the share price in May 2015.

Calculate the share price in May 2015.

$ ..... [3]

2 – (0580/42_Summer_2017_Q1) – *Ratio And Proportion, Percentages*

(a) Annie and Dermot share \$600 in the ratio 11 : 9.

(i) Show that Annie receives \$330.

[1]

(ii) Find the amount that Dermot receives.

\$ ..... [1]

(b) **(i)** Annie invests \$330 at a rate of 1.5% per year compound interest.

Calculate the amount that Annie has after 8 years.
Give your answer correct to the nearest dollar.

\$ ..... [3]

(ii) Find the amount of **interest** that Annie has, after the 8 years, as a percentage of the \$330.

..... % [2]

(c) Dermot has \$70 to spend.
He spends \$24.75 on a shirt.

(i) Find \$24.75 as a fraction of \$70.
Give your answer in its lowest terms.

..... [1]

(ii) The \$24.75 is the sale price after reducing the original price by 10%.

Calculate the original price.

\$ ..... [3]

(d) After one year, the value of Annie's car had reduced by 20%.
At the end of the second year, the value of Annie's car had reduced by a further 15% of its value at the end of the first year.

(i) Calculate the overall percentage reduction after the two years.

..... % [2]

(ii) After three years the overall percentage reduction in the value of Annie's car is 40.84%.

Calculate the percentage reduction in the third year.

..... % [2]

3 – (0580/43_Summer_2017_Q1) – *Upper And Lower Bound, Percentages*

(a) In 2016, a company sold 9600 cars, correct to the nearest hundred.

(i) Write down the lower bound for the number of cars sold.

..... [1]

(ii) The average profit on each car sold was $2430, correct to the nearest $10.

Calculate the lower bound for the total profit.
Write down the exact answer.

$..... [2]

(iii) Write your answer to **part (a)(ii)** correct to 4 significant figures.

$..... [1]

(iv) Write your answer to **part (a)(iii)** in standard form.

$..... [1]

(b) In April, the number of cars sold was 546.
This was an increase of 5% on the number of cars sold in March.

Calculate the number of cars sold in March.

..... [3]

(c) The price of a new car grows exponentially by 3% per year.
A new car has a price of $3000 in 2013.

Find the price of a new car 4 years later.

$..... [2]

4 – (0580/41_Winter_2017_Q1) – *Ratio And Proportion, Percentages*

(a) A library has a total of 10 494 fiction and non-fiction books.
The ratio fiction books : non-fiction books = 13 : 5.

Find the number of non-fiction books the library has.

..... [2]

(b) The library has DVDs on crime, adventure and science fiction.
The ratio crime : adventure : science fiction = 11 : 6 : 10.
The library has 384 **more** science fiction DVDs than adventure DVDs.

Calculate the number of crime DVDs the library has.

..... [2]

(c) Every Monday, Sima travels by car to the library.
The distance is 20 km and the journey takes 23 minutes.

(i) Calculate the average speed for the journey in kilometres per hour.

.....km/h [2]

(ii) One Monday, she is delayed and her average speed is reduced to 32 km/h.

Calculate the percentage increase in the journey time.

.....% [5]

(d) In Spain, the price of a book is 11.99 euros.
In the USA, the price of the same book is $12.99 .
The exchange rate is $1 = 0.9276 euros.

Calculate the difference between these prices.
Give your answer in dollars, correct to the nearest cent.

$..... [3]

(e) 7605 books were borrowed from the library in 2016.
This was 22% less than in 2015.

Calculate the number of books borrowed in 2015.

..... [3]

ANSWERS

1 – (0580/41_Summer_2017_Q1) – *Percentages, Ratio And Proportion*

(a)(i)	275.31
(a)(ii)	3202
(b)	17.[0] or 17.00 to 17.01
(c)(i)	40
(c)(ii)	11.9 or 11.86 to 11.87
(d)	150 [million] oe
(e)	250 nfww

2 – (0580/42_Summer_2017_Q1) – *Ratio And Proportion, Percentages*

(a)(i)	$600 \div (11+9) \times 11$ [=330] with no errors seen
(a)(ii)	270
(b)(i)	372 cao nfww
(b)(ii)	12.6 or 12.7 or 12.63 to 12.73
(c)(i)	$\frac{99}{280}$ cao final answer
(c)(ii)	27.5[0]
(d)(i)	32 cao
(d)(ii)	13 cao

3 – (0580/43_Summer_2017_Q1) – *Upper And Lower Bound, Percentages*

(a)(i)	9550
(a)(ii)	23158750
(a)(iii)	23160000
(a)(iv)	2.316×10^7
(b)	520 nfww
(c)	3380 or 3376 to 3377

4 – (0580/41_Winter_2017_Q1) – *Ratio And Proportion, Percentages*

(a)	2915	**2**	**M1** for 10 494 ÷ (13 + 5) oe
(b)	1056	**2**	**M1** for 384 ÷ (10 – 6) oe
(c)(i)	52.2 or 52.17…	**2**	**M1** for 20 ÷ 23 or 20 × 60 or 23 ÷ 60 isw If zero scored, **SC1** for answer 52.6 (from use of 0.38)
(c)(ii)	63[.0] or 63.03 to 63.05…	**5**	**M4** for $\frac{\textit{their}\ 52.17... - 32}{32} \times 100$ oe or **M3** for $\frac{\textit{their}\ 52.17... - 32}{32}$ oe or $\frac{\textit{their}\ 52.17...}{32} \times 100$ oe OR **B2** for $\frac{5}{8}$ [hours] oe or 37.5 [minutes] or **M1** for 20 ÷ 32 or better and **M2** for $\frac{\textit{their}\ 37.5 - 23}{23} \times 100$ oe or **M1** for $\frac{\textit{their}\ 37.5 - 23}{23}$ or $\frac{\textit{their}\ 37.5}{23} \times 100$
(d)	0.06 final answer nfww	**3**	**M1** for 11.99 ÷ 0.9276 or 12.99 × 0.9276 **A1** for 12.93 or 12.925 to 12.926
(e)	9750	**3**	**M2** for $7605 \div \left(1 - \frac{22}{100}\right)$ oe or **M1** for (100 – 22)[%] correctly associated with 7605 seen