**Time:**

**Practice paper 4**

**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.
* Without sufficient working, correct answers may be awarded no marks.
* Answer the questions in the spaces provided
*– there may be more space than you need.*
* **Calculators may be used.**
* You must **NOT** write anything on the formulae page.

 Anything you write on the formulae page will gain NO credit.

**Information**

* The total mark for this paper is ….
* 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.
* Check your answers if you have time at the end.

**2** The diagram shows the straight lines *AB* and *BC* drawn on a centimetre grid.

(*a*)Write down the coordinates of

 (i) *C*

(............................ , ............................)

 (ii) *B*

(............................ , ............................)

**(2)**

(*b*)On the grid, mark the point *D* so that *ABCD* is a kite.

**(1)**

(*c*)Work out the gradient of *AB*.

.......................................................

**(2)**

**(Total for Question 2 is 5 marks)**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**3** Rectangle **A** is made from centimetre squares.

(*a*)What fraction of rectangle **A** is shaded?

.......................................................

**(1)**

Rectangle **B** is made from centimetre squares.

(*b*)Shade 20% of rectangle **B**.

**(1)**

(*c*)Work out 30% of 185.

.......................................................

**(2)**

**(Total for Question 5 is 3 marks)**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**4** Here is a sequence of shapes drawn on a square grid.

(*a*)On the grid, draw Shape number 4

**(1)**

The table shows the number of shaded squares in the first three shapes.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Shape number** | 1 | 2 | 3 | 4 | 5 |
| **Number of shaded squares** | 8 | 12 | 16 |  |  |

(*b*)Complete the table to show the number of shaded squares in Shape number 4 and

 Shape number 5.

**(1)**

(*c*)Work out the number of shaded squares in Shape number 9.

.......................................................

**(2)**

The width of Shape number 1 is 3 squares.

The width of Shape number 2 is 4 squares.

(*d*)Find the width of Shape number 8.

....................................................... squares

**(1)**

The width of Shape number *n* is *W* squares.

(*e*)Write down a formula for *W* in terms of *n*.

.......................................................

**(2)**

**(Total for Question 4 is 7 marks)**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**5** (*a*)Put brackets in the following to make the calculation correct.

 (i) 2 + 4 × 6 − 3 = 33

 (ii) 2 + 4 × 6 −3 = 14

**(2)**

(*b*)Work out the value of 

.......................................................

**(2)**

**(Total for Question 5 is 4 marks)**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**7** The table shows temperatures recorded on five planets.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Planet** | Venus | Earth | Mars | Jupiter | Uranus |
| **Temperature (°C)** | 458 | 14 | −55 | −153 | −214 |

(*a*)What is the difference between the temperatures recorded on

 (i) Earth and Mars,

....................................................... °C

 (ii) Jupiter and Mars?

....................................................... °C

**(2)**

A temperature recorded on Pluto is 693°C less than the temperature recorded on Venus.

(*b*)Work out the temperature on Pluto.

....................................................... °C

**(1)**

(*c*)Work out the mean of

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 458 | 14 | −55 | −153 | −214 |

.......................................................

**(2)**

**(Total for Question 7 is 5 marks)**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**10** (*a*) Simplify 9*x*2 + 2*x*2 – 5*x*2

.......................................................

**(1)**

*e* = 2*f* − 5*g*

(*b*)Find the value of *e* when *f* = 12 and *g* = 3

*e* =.......................................................

**(2)**

**(Total for Question 10 is 3 marks)**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**12** (*a*)(i) Find 

 Write down all the figures on your calculator display.

..................................................................................

 (ii) Write your answer to (*a*)(i) correct to 2 decimal places.

.......................................................

**(2)**

(*b*)(i) Use your calculator to work out the value of

 

 Write down all the figures on your calculator display.

..................................................................................

(ii) Write your answer to (*b*)(i) correct to 3 significant figures.

.......................................................

**(3)**

**(Total for Question 12 is 5 marks)**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**13** Here is a list of five fractions.



(*a*)(i) Write down the smallest fraction in the list.

.......................................................

 (ii) Write down the largest fraction in the list.

.......................................................

**(2)**

(*b*)Complete the statement below to show a fraction that is equivalent to 

 

**(1)**

**(Total for Question 13 is 3 marks)**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**14 **

 ****

(*a*)List the members of the set *P*.

.......................................................

**(2)**

(*b*)List the members of the set *Q*.

.......................................................

**(1)**

**(Total for Question 14 is 3 marks)**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**16** *D* = 7*c*2 + *f*

(*a*)Work out the value of *D* when *c = −*2and *f* = 5

*D* = .......................................................

**(2)**

(*b*)Solve 5(*q* – 3) = 12 − *q*

 Show clear algebraic working.

*q* = .......................................................

**(3)**

(*c*)Solve the inequality 3 – 7*t* ≥ 31

.......................................................

**(2)**

**(Total for Question 16 is 7 marks)**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**17** Here are the first five terms of a number sequence.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 7 | 11 | 15 | 19 | 23 |

(*a*) Find an expression, in terms of *n*, for the *n*th term of this sequence.

.......................................................

**(2)**

The *n*th term of a different number sequence is given by 80 – 2*n*

(*b*)Write down the first 3 terms of this sequence.

............................... , ............................... , ...............................

**(2)**

Yuen says there are no numbers that are in both of the sequences.

Yuen is correct.

(*c*)Explain why.

......................................................................................................................................................

......................................................................................................................................................

**(1)**

**(Total for Question 17 is 5 marks)**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**19** 2.2 × 107 passengers passed through Beijing Capital International Airport in 2014.

(*a*)Write 2.2 × 107 as an ordinary number.

.......................................................

**(1)**

950 000 tonnes of cargo traffic passed through Tokyo International Airport in 2014.

(*b*)Write 950 000 as a number in standard form.

.......................................................

**(1)**

(*c*)Work out 

 Give your answer in standard form.

.......................................................

**(2)**

**(Total for Question 19 is 4 marks)**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**20** In a sale, all normal prices are reduced by 15%

The normal price of a mixer is reduced by 22.50 dollars.

Work out the normal price of the mixer.

.......................................................dollars

**(Total for Question 20 is 3 marks)**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**22** Here is a regular 10-sided polygon.

Work out the value of *x*.

Show your working clearly.

*x* = ........................................

**(Total for Question 22 is 4 marks)**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**TOTAL FOR PAPER: … MARKS**