THE G C SCHOOL OF CAREERS

MATHEMATICS DEPARTMENT

SCHOOL YEAR 2021 – 2022

SAMPLE EXAMINATION PAPER

FORM 1

INFORMATION TO CANDIDATES

Answer ALL the questions in the space provided.

No calculator is allowed.

This paper has **20 questions**.

The total mark for this paper is **100**.

There are 14 pages in this question paper.

1.

a) Express the following in index form:

$3 \times 3 \times 3 \times 5 \times 5 \times 7 \times 7 \times 7 \times 7$

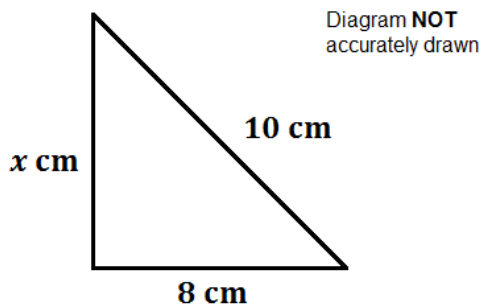Answer: _____

(2)

b) Simplify the following:

$9m^{-3} \times 2m^{-5} \times 3m^2$

Answer: _____

(2)

(Total for Question 1 is 4 marks)

---

2. Here is a right-angled triangle. Calculate the value of x.

Diagram **NOT** accurately drawn

10 cm

x cm

8 cm

$x =$_____ cm

(Total for Question 2 is 3 marks)

---

3. Find the value of the following expression if $a = 4$, $b = -1$ and $c = -3$

$$\frac{(2a - b) \times c}{c^3} =$$

Answer: _____

(Total for Question 3 is 3 marks)

---

4. Arrange the following numbers in ascending order.

$$88\% \ , \ \frac{8}{9} \ , \ 0.8 \ , \ \frac{17}{20}$$

Answer: _____

(Total for Question 4 is 3 marks)

5.

a) Express 396 as a product of its prime factors.

$396 = $_____

(2)

b) Given that

$$3780 = 2^2 \times 3^3 \times 5 \times 7 \qquad \text{and} \qquad 3240 = 2^3 \times 3^4 \times 5$$

Find the highest common factor (HCF) of 3780 and 3240.

HCF=_____

(1)

(Total for Question 5 is 3 marks)

6. Round the following, to the number of decimal places or significant figures indicated in the brackets.

    a) 45.8632   (2 $d.p$)   _____

    b) 0.01287   (1 $s.f.$)   _____

    c) 79.957   (1 $d.p.$)   _____

    d) 536.51   ($nearest\ whole\ number$)   _____

(Total for Question 6 is 4 marks)

---

7. Simplify the following expressions. Give your answer in its simplest form.

    a) $4ab + 8abc - 11ba - 2bca =$

Answer: _____
                  (2)

    b) $7x(3xy + 2x) - 9x^2(8 - 7y) =$

Answer: _____
                  (2)

    c) $\dfrac{8k^3 a^6 m}{21m^2 ka} \div \dfrac{24a^3}{7k^2 m} =$

Answer: _____
                  (4)

(Total for Question 7 is 8 marks)

---

8. Becca is twice as old as Susan and Greg is 9 years older than Susan.
The sum of their ages is 37.
How old is each?

Becca's age:_____

Susan's age:_____

Greg's age:_____

(Total for Question 8 is 4 marks)
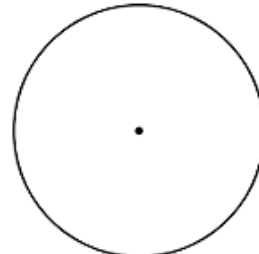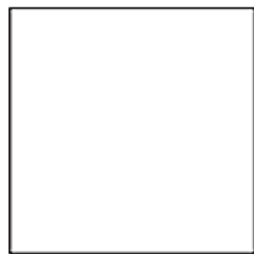
9. The diagram shows a square and a circle.

Diagram **NOT**
accurately drawn

The square has area $64\ cm^2$
The diameter of the circle is equal to the length of a side of the square.
Work out the area of the circle.
Give your answer in terms of π.

_____cm^2

(Total for Question 9 is 4 marks)

10.   Lisa sees a dress in a sale.
The normal price of the dress is £75
The price of the dress is reduced by 12% in the sale.

a) Work out the price of the dress in the sale.

£ =_____

(3)

Lisa's weekly pay increases from £525 to £630

b) Calculate her percentage pay increase.

_____%

(3)

(Total for Question 10 is 6 marks)

11. Change $0.3\dot{9}\dot{5}$ into a fraction in its simplest form.
Show all the steps in your workings.

(Total for Question 11 is 4 marks)

12. Find the value of the following:

a) $4 - 3 \times [(7 - 10) \div (2 \times 1 + 125 \div 5)^0 + (5 - 11)] =$

Answer: _____

(4)

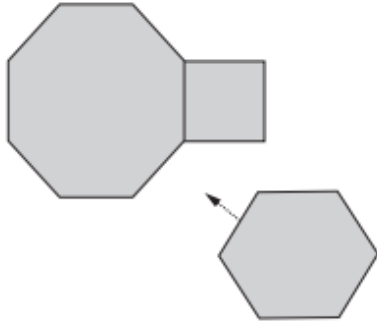b) $\frac{2}{5} \div \left[9\frac{3}{5} \times \left(\frac{7}{6} - \frac{3}{8} \right) \right] =$

Answer: _____

(4)

(Total for Question 12 is 8 marks)

13. A pupil has three tiles. One is a regular octagon, one is a regular hexagon, and one is a square. The side length of each tile is the same. The pupil says the hexagon will fit exactly like this. Is the pupil correct? **Justify your answer.**

Answer: _____

(Total for Question 13 is 4 marks)

14. A machine has a buzzer that sounds every 50 minutes.
The machine also has a bell that sounds every 80 minutes.

The buzzer and the bell sound together at 10 am.

Find the time at which they next sound together.

Answer: _____

(Total for Question 14 is 4 marks)

15. Solve the following equations:

a) $5 - 2(3x - 1) = 10x$

Answer: _____

(2)

b) $\dfrac{2+3x}{15} - \dfrac{4x-11}{3} = \dfrac{2}{5}$

Answer: _____

(3)

c) $\dfrac{x^2}{3} + 8 = 11$

Answer: _____

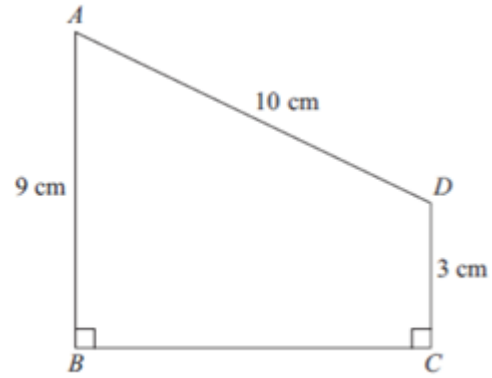**(3)**

d) $\dfrac{3\sqrt{x+1}}{5} = 6$

Answer: _____

(2)

(Total for Question 15 is 10 marks)

16. *ABCD* is a trapezium

Find the area of the trapezium.

(Total for Question 16 is 4 marks)

---

17. Yulia normally lives in Russia. She buys a car in Cyprus.
The cost of the car is 15400 euros. The exchange rate is 1 euro = 60 Russian Rubles.

a) Change 15400 euros into Russian Rubles.

_____Russian Rubles

(2)

The cost of insuring the car is 462 euros.

b) Express 462 as a percentage of 15400.

_____%

(2)

(Total for Question 17 is 4 marks)

18. The diagram shows a quadrilateral $ABCD$.
$AB = BD = AD$
$CB = CD$
Angle $BCD = 78°$
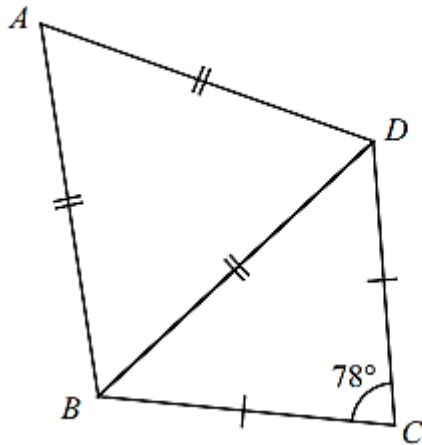Work out the size of angle ABC, **giving reasons for your workings.**

Diagram **NOT**
accurately drawn

Answer:_____°

(Total for Question 18 is 4 marks)

19. Becky has a biased 6-sided spinner. She spins the spinner 100 times.
She records the score for each spin.
The table shows information about her scores.

Score	Frequency
1	29
2	25
3	12
4	15
5	10
6	9

a) Find her mean score.

(4)

b) Work out her median score.

(3)

c) Work out the range.

(1)

(Total for Question 19 is 8 marks)

20. *ABCD* is a parallelogram. Angle *DCB* = 110°

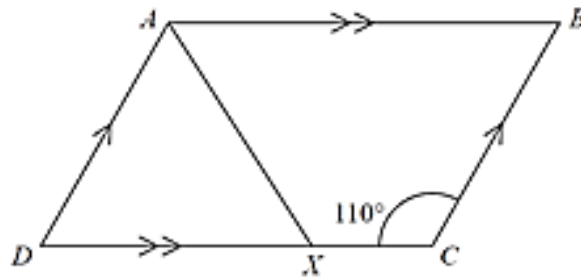 *X* is the point on *DC* such that *AX* **bisects** the angle *DAB*.

Diagram NOT
accurately drawn

a) Calculate the size of the angle *BAD*, giving reason for your workings.

Answer:_____ °

Reason(s):_____ **(2)**

b) Write down the size of the angle *DAX*, giving reason for your answer.

Answer:_____ °

Reason:_____ **(2)**

13

c) Calculate the size of the angle AXC, giving reasons for your workings.

Answer:_____ °

Reasons:_____

_____

(4)

(Total for Question 20 is 8 marks)

END OF PAPER

Extra Paper