ST GEORGE'S
ASCOT

Time allowed: 1 hour
(Extra Time: 15 mins)

Total marks available: 78

Name: ..... Form: .....

*Calculators **may** be used.*

You may NOT borrow any equipment from another girl.

Instructions:

- *Try to answer all of the questions in the paper.*
- *If stuck on a question, move on to the next one – you can always go back at the end if you have time.*
- *Answer all questions in the spaces provided on this paper. Rough paper and tippex are not allowed – if you make a mistake neatly cross it out and write in your corrections.*
- *You must write in black or blue ink. Pencil must be used for any graphs or diagrams.*
- *Show all working out – marks may be awarded for correct method even if your final answer is wrong. Without sufficient working, correct answers may not be awarded full marks.*

Write your final answers clearly. Illegible or ambiguous answers may not be marked.

1. Work out the following. (you will get NO marks for using a calculator on this question)

$$2\frac{1}{3} - 1\frac{3}{7}$$

$2 - 1 = 1$

$\frac{1}{3} - \frac{3}{7}$

$= \frac{7}{21} - \frac{9}{21}$

$= -\frac{2}{21}$

$1 - \frac{2}{21}$

OR

$\frac{7}{3} - \frac{10}{7}$

$= \frac{49}{21} - \frac{30}{21} =$

Answer $\frac{19}{21}$ (2)

2. What is the **sum** of the **interior angles** of an octagon?

$180 \times (8-2) = 1080$

OR

$360 \div 8 = 45$

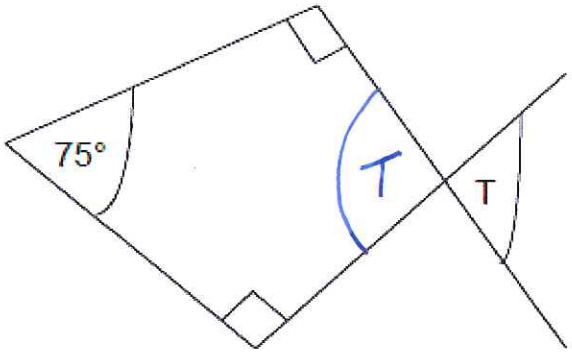
$180 - 45 = 135$

$135 \times 8 =$

Answer 1080 (3)

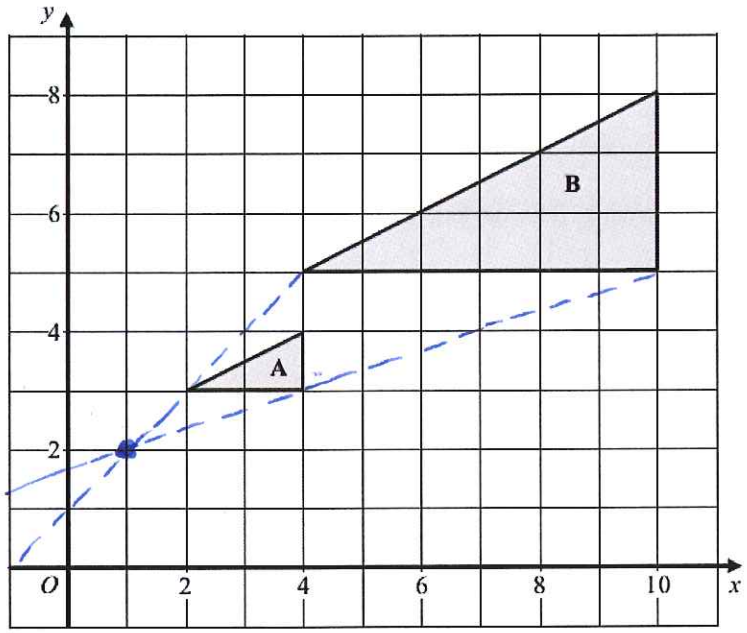
3. Calculate the angle marked T.

360 - 90 - 90 - 75 = T



T = 105 (2)

4.



$\frac{6}{2} = 3$

Describe fully the **single** transformation which maps triangle **A** onto triangle **B**.

Enlargement centre (1, 2)
scale factor 3

(Total 3 marks)

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5. (a) Write $3^8 \times 3^6$ as a power of 3

3^{14}

.....

(1)

(b) Write $\frac{7^5}{7^2}$ as a power of 7

7^3

.....

(1)

(c) $\frac{5^n \times 5^3}{5^7} = 5^2$

Find the value of n.

$5^{n+3-7} = 5^2$

$n - 4 = 2$

$+4$

$n =$ 6

(2)

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6. Estimate the answer to the following. (No marks will be given for long calculations or the use of a calculator)

$\frac{518 \times 91}{42} \approx \frac{500 \times 90}{40} \approx \frac{45000}{40}$

$4\overline{)4500}$

Answer 1125 (2)

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7. Find the formula n^{th} term for the following sequence: 1, 6, 11, 16, 21, ...

diff = +5

Answer $5n - 4$ (2)

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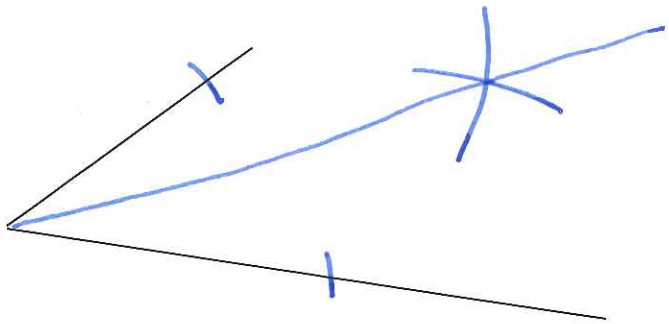
10. Construct the bisector of this angle.



(2)

11. (a) Simplify $5p - 2q + 3p - 4q$

$8p - 6q$

(2)

(b) Expand $3(2t + 5)$

$6t + 15$

(1)

(c) Expand $y(y^2 - 3y)$

$y^3 - 3y^2$

(2)

(d) Expand and simplify $(x + 3)(x + 7)$

$x^2 + 7x + 3x + 21$

$x^2 + 10x + 21$

(2)

8. A counter is picked from a bag containing 15. There are 3 red, 1 black, 7 blue and the remaining are green. Work out the probability of picking :

a) A red counter

Answer $\frac{3}{15} = \frac{1}{5}$ (1)

b) A yellow counter

Answer 0 (1)

c) A red, blue or green counter

$3 + 7 + 4 = 14$

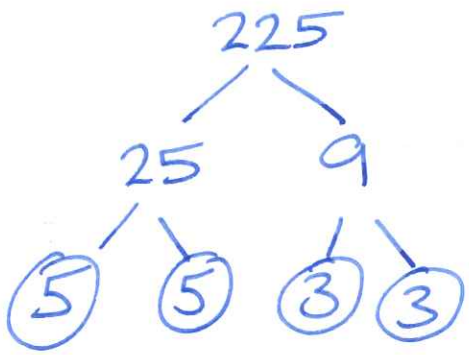
Answer $\frac{14}{15}$ (1)

d) Not picking a red counter

$15 - 3 = 12$

Answer $\frac{12}{15} = \frac{4}{5}$ (1)

9. Express 225 as the product of its prime factors



$3 \times 3 \times 5 \times 5$ (2)

12. Rectangular tiles have width x cm and height $(x + 7)$ cm.

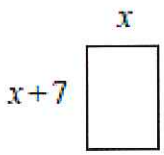


Diagram **NOT** accurately drawn

Some of these tiles are used to form a shape.
The shape is 6 tiles wide and 4 tiles high.

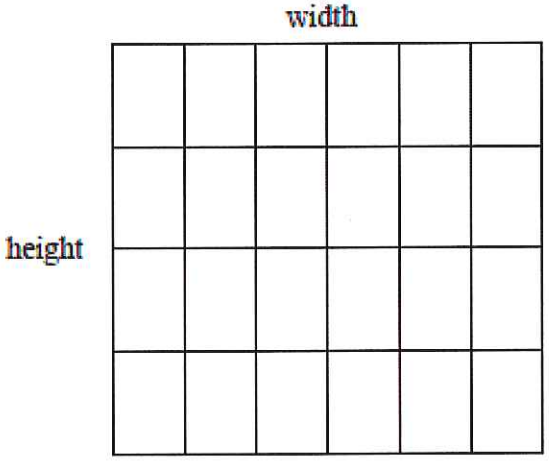


Diagram **NOT** accurately drawn

(a) Write down expressions, in terms of x, for the width and height of this shape.

width = $6x$ cm

height = $4x + 28 = 4(x+7)$ cm

(2)

(b) The width and the height of this shape are equal.

(i) Write down an equation in x.

$6x = 4x + 28$

(ii) Solve your equation to find the value of x.

$6x = 4x + 28$

$-4x$

$2x = 28$

$\div 2$

$x = 14$

$x = 14$

(4)

(Total 6 marks)

13. **Without** using a calculator, answer the following questions.
You must show **full working** (or explain how you worked out your answer) to gain marks.

(a) Write $\frac{9}{20}$ as a percentage

$\frac{9}{20} \times \frac{5}{5} = \frac{45}{100}$ OR $\frac{9}{20} = 0.45$ $\times 100$

Answer 45% (1)

(b) Find $\frac{5}{8}$ of £6400

$8 \overline{)6400} = 800$

$800 \times 5 = 4000$

Answer 4000 (1)

14. The sale price of a pair of shoes is £42 after a 23% reduction, what was the original price of the shoes? Round off your answer to the nearest pence.

$100 - 23 = 77$

$\frac{42}{77} \times 100$

Answer £54.55 (2)

15. Solve $3(j + 4) = 24$

$3j + 12 = 24$

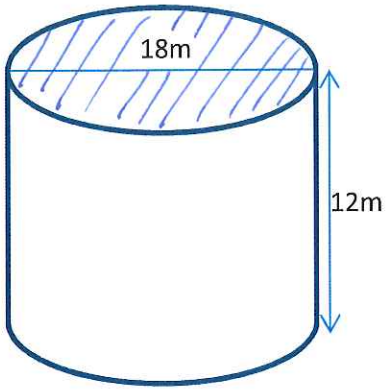
-12 $3j = 12$

$\div 3$ $j = 4$

Answer $j = 4$. (2)

16. The diagram shows a cylinder of diameter 18m and length 12m. Work out the following giving correct units for your answer to (b) and (c) **correct unit.** Use **π = 3.14** in your calculation. (Diagram are not drawn to scale)

a) Shade the cross-section of the cylinder.



b) Work out the area of cross section you shaded in (a)

$\pi r^2 = 3.14 \times 9^2$

Area of cross section = $254.34\ m^2$ (2)

c) Work out the volume of the cylinder

254.34×12

Volume of the cylinder = $3052.08\ m^3$ (2)

17. ***Without using a calculator*** show that:

a. $611 \div 13 = 47$

$13 \times 4 = 52$

$13 \times 7 = 91$

$13 \overline{)611}$ → 47

Answer 47 (2)

b. $312 \times 43 = 13416$

$$\begin{array}{r} 312 \\ \times\ 43 \\ \hline 936 \\ 12480 \\ \hline 13416 \end{array}$$

Answer 13416 (2)

18. The mean of three numbers is 16 and their range is 10. If their median is 18, what are the three numbers?

$16 \times 3 = 48$

$13 \xleftarrow{-5} 18 \xrightarrow{+5} 23$

$13 - 3 = 10$

$23 - 3 = 20$

Answer 10, 18, 20. (3)

19. Using your calculator work out the answers to the sums below

(a) Find the value of 3.9^2

15.21

(1)

(b) Find $\sqrt{6.76}$

2.6

(1)

(c) Find the cube root of 2744

14

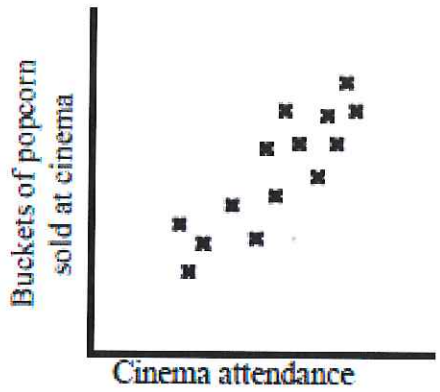
(1)

(d) Work out the value of $\frac{6.46}{1.8+1.6}$

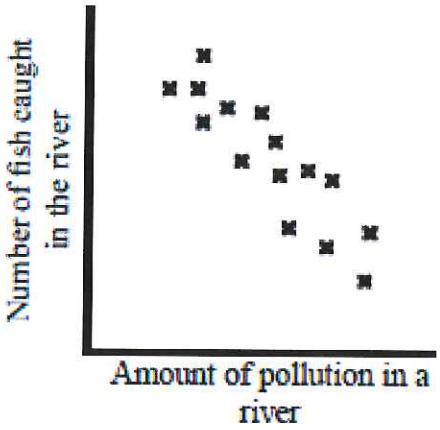
1.9

(2)

20. a) Describe the correlation shown in each of the graphs below.



Answer positive (2)



Answer Negative (2)

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21. Find the mean from this frequency table :

Petals on a daisy	9	10	11	12	13
Frequency	9	14	17	21	6

$$\frac{9\times9+10\times14+11\times17+12\times21+13\times6}{9+14+17+21+6} = \frac{738}{67}$$

$$= 11.0149254$$

Answer ≈ 11.0 (3)

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22. Given that y is **directly proportional** to x. When x = 2, y = 6

a) Work out a formula for y in terms of x.

$y = kx$ → $6 = 2k$ $k = 3$

Answer $y = 3x$ (2)

b) Use your formula in (a) to work out y when x = 3.5

3.5×3

Answer 10.5 (2)

c) Use your formula in (a) to work out x when y = 15.9

$15.9 = 3x$

$\div 3$

Answer 5.3 (2)

23. Wyn and Jay are using their wheelchairs to measure distances.

(a) The large wheel on **Wyn's** wheelchair has a **diameter** of **60cm.**
Wyn pushes the wheel round **exactly** once.

Calculate how far Wyn has moved.

Show your working.

circ = π × d
= π × 60
= 188.49556

188.5 ..... cm

2 marks

(b) The large wheel on **Jay's** wheelchair has a **diameter** of **52cm.**

Jay moves her wheelchair forward **950cm.**

Calculate how many times the large wheel goes round. Show your working.

π × 52
= 163.363

950 ÷ 163.363

5.8 ..... Times

2 marks

End of Paper