EMANUEL SCHOOL

# Mathematics

## 13+ SAMPLE PAPER

### Non-Calculator

### 1 hour

**Information for pupils**
Answer all questions showing your working clearly

1. Work out the following

(a) 42 x 13 (b) 56.23 + 87.1497

(c) 8.4 - 2.481 (d) 0.24 ÷ 0.08

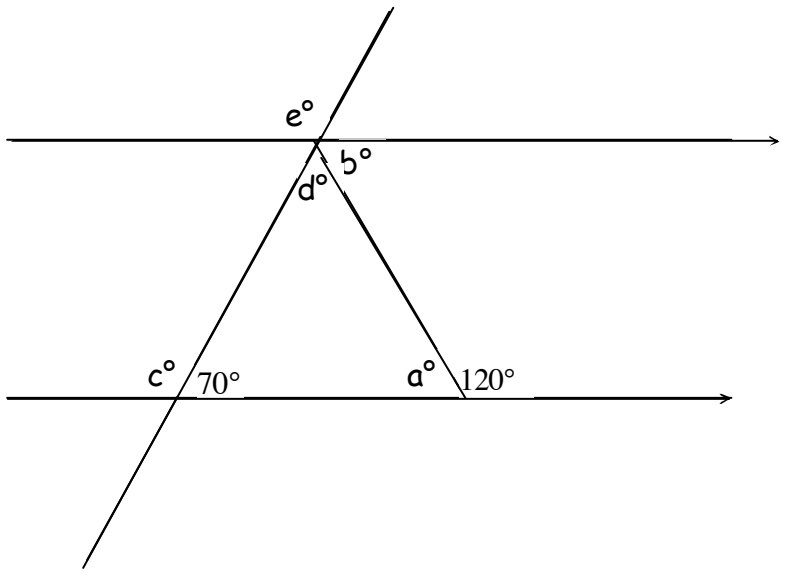
2. Calculate:

a) $\frac{1}{5} + \frac{3}{4}$

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

c) $\frac{3}{7} \times \frac{28}{33}$

3. Find the size of the angles marked with a letter:




a =

b =

c =

d =

e =

4. Find $\frac{2}{5}$ of 45

5. If S = a(b + c), find S when a = 3, b = 4, c = 5

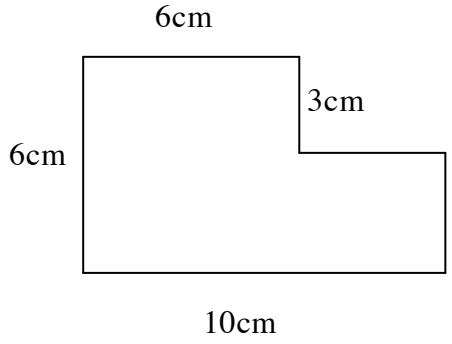
6. Find the mean of 45, 23, 89, 12, 33

7. Complete the table below showing your working clearly underneath. Write the fractions in their lowest terms.

| **Fraction** | **Decimal** | **Percentage** |
|---|---|---|
| | 0.25 | |
| | 0.6 | |
| | | 5% |
| $\frac{7}{25}$ | | |

8. Find the area of the shape below

(b)




Area = _____

9. Find the value of

a) $2^3$

b) $5.3 \times 10^2$

10. Write as a single expression in index form

a) $2^2 \times 2^4$

b) $\frac{4^6}{4^4}$

11. A number is chosen at random from the first 12 positive numbers. What is the probability that it is a prime number?

12. Round each number to the accuracy given in brackets

a) 24.79 (2.s.f.)

b) 23.55 (1.d.p.)

c) 399 (1.s.f)

13. In a class of 30 pupils, 60% have school dinners and the rest have a packed lunch. How many pupils:

a) have a school dinner.

b) have a packed lunch.

14. Simplify

a) $5y \times 3y$

b) $7(2x - 3)$

c) $5 - (x + 3)$

d) $2x + 4(x + 3) - 2$

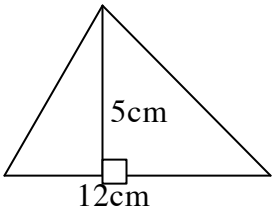
15. Calculate the area of each shape

(a)




Area = _____

(b)




Area = _____

16. Write down the next two numbers in each pattern:

(a) 10.5, 8, 5.5, 3 ,_____, _____

(b) 14, 11, 7, 2, ,_____,

(c) -17.5,-13,- 8.5,- 4,_____, ____

(d) -17,-12, - 8, –5, _____, _____,

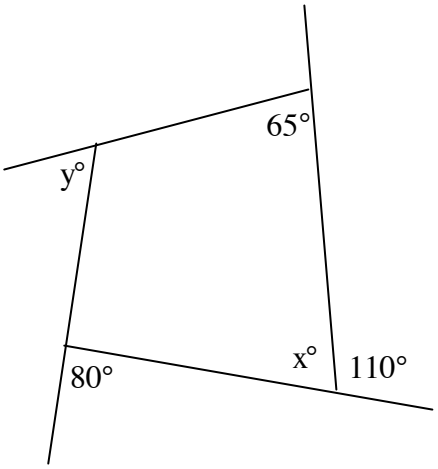
17. Divide £24 into the ratio 3 : 5

18. In class 7B, $\frac{3}{4}$ of the pupils support United, $\frac{2}{9}$ of the pupils support City and the rest support Rovers. There are 36 pupils in class 7B.

**(a)** How many pupils support United?

**(b)** How many pupils support Rovers?

19. Find the size of the marked angles.




x° = .....

y° = .....

20. A letter is chosen from the word

T R A N S L A T I O N

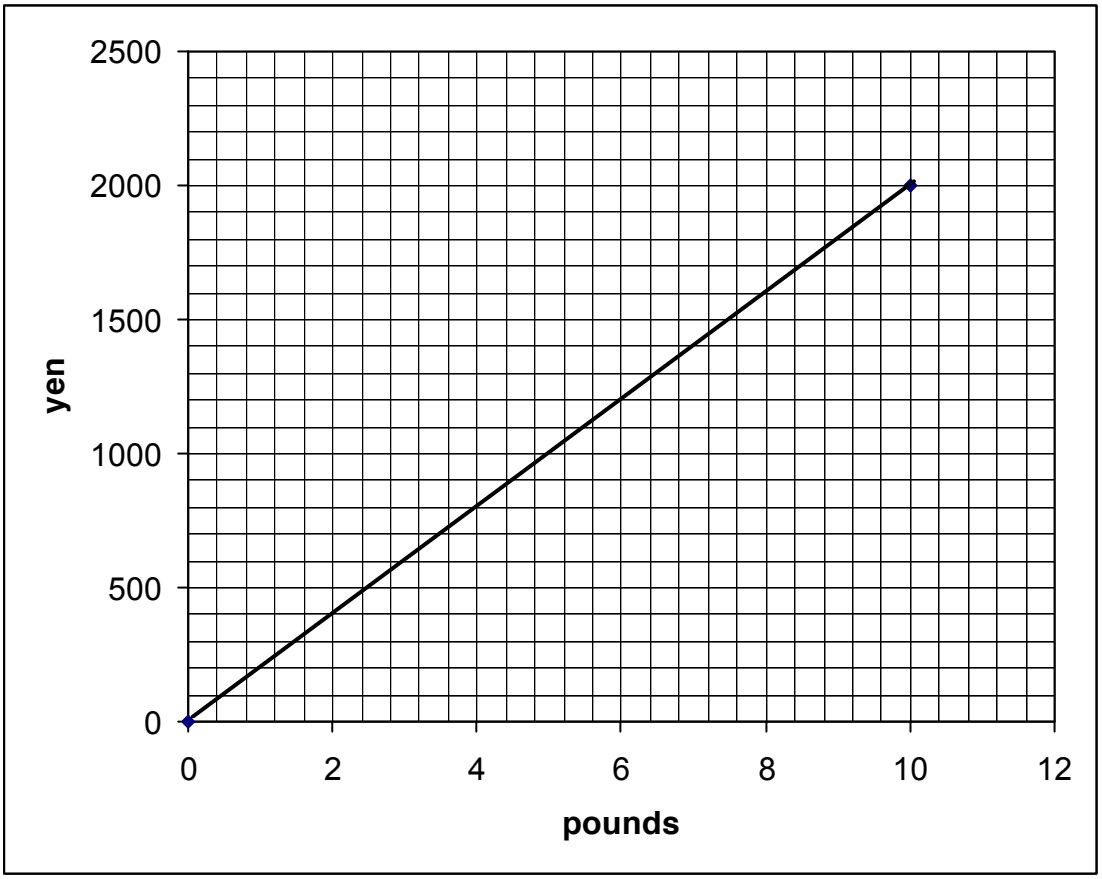
Find the probability that the letter is:

(a) an S

(b) not a T

(c) a vowel

21. The graph below converts between pounds (£) and Japanese yen.




i) Use the graph to convert £10 to yen.

ii) Convert 450 yen to pounds.

22. Solve the following equations

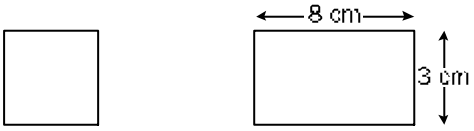
a) $2x + 4 = 10$

b) $18 - 5x = 3$

c) $x + 3 = 2x - 4$

d) $5(x - 3) = 15$

23. The perimeter of the square and the rectangle are the same.
Work out the length of a side of the square.




Square side =

24. (a) Given that $G = 8h + y$

Find G if (i) $h = 6$ and $y = -2$

G = _____

(ii) $h = -12$ and $y = -4$ G = _____

(b) Given that $x = \frac{(a - z)^2}{t}$

Find x if (i) a = 16 z = 4 t = 12

x = _____

(ii) a = -8 z = -2 t = -9

x = _____

25. If the scale on a map is 1 : 25 000, what is the actual distance in km if the distance on the map is 5cm

26. Complete the tables below for the given equations:

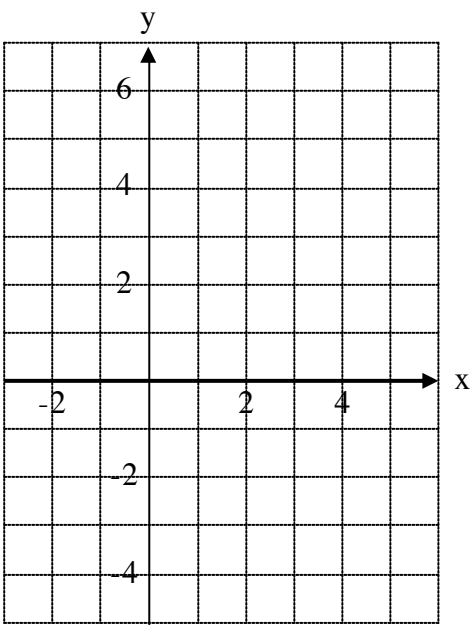
a) y = 2x + 1

| x | 0 | 1 | 2 |
|---|---|---|---|
| y | | | |

b) x + y = 4

| x | 0 | | 1 |
|---|---|---|---|
| y | | 0 | |

c) Use your tables to draw the lines y = 2x + 1 and x + y = 4 on the grid below. Label each line.




**THE END**