WHITGIFT

MATHEMATICS ENTRANCE EXAMINATION SAMPLE QUESTIONS

FOR 13+ AGE GROUP

SAMPLE

- Group D – Boys aged 13+ on 1st September

Calculators are **NOT** allowed.

SAMPLE QUESTIONS

The questions which follow have been set in past entrance examinations and have been selected to demonstrate the ways in which both basic skills and understanding of simple concepts are tested. A complete paper consists of about 25 questions to be answered in 1 hour.

1. Work out the following:

   (a) $17 - 2(5+1) =$ ……

   (b) $\frac{8 \times 7 + 6 \times 7}{(4+3)(12-10)} =$ ……

   (c) 15% of £560 = ……

   (d) $\frac{5}{8}$ of 24cm = ……

2. The ancient Egyptians used a system of units in which 96 *digits* make one *cubit*. The perimeter of the base of the Little Pyramid at Giza is 572 cubits. Use long multiplication to express this distance in digits.



Answer: ……

3. Solve the following equations to find the value of x

   (a) $5x - 1 = 19$

   Answer:……

   (b) $7 - 4x = x + 8$

   Answer:……

   (c) $3x = 42$

   Answer:……

   (d) $\frac{2x + 5}{7} = 3$

   Answer:……

SAMPLE

4. A bag contains beads of two colours: orange and turquoise. When a bead is picked at random from the bag, the probability of it being orange is $\frac{4}{9}$. Write down the probability that the bead is turquoise.

Answer:……

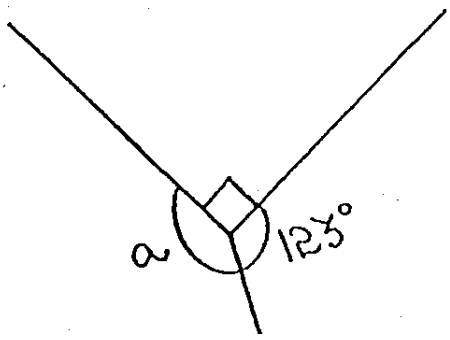
If there are, in fact, 108 beads in the bag, how many of them are turquoise?

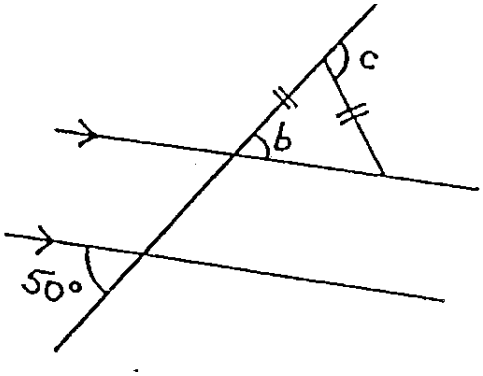
Answer:……

5. Complete the following table showing equivalent decimals, fractions and percentages. Write all fractions in their lowest terms.

Decimal	**Fraction**	**Percentage**
0.25	$\frac{1}{4}$	25%
0.04		
	$\frac{1}{8}$	
		163%
	$\frac{1}{5}$	

6. Find the size of each of the angles a, b and c shown below, giving a reason for each.





a = ……. b = ……. c = …….

Reason:……. Reasons:…….

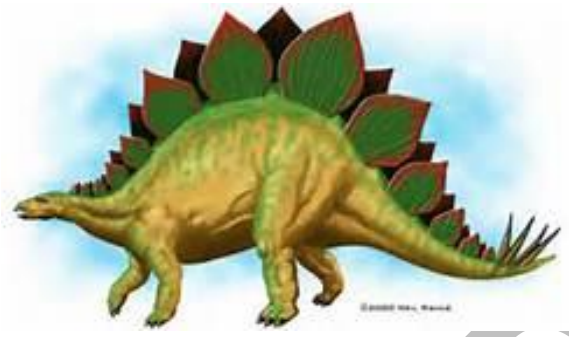
SAMPLE

7. If p = 5, q = -2 and r = 12, write down the values of the following:

(a) $3p^2$ = ……. (c) qp = …… (e) pqr = …….

(b) P^3 = ……. (d) (p-q)(r+q) = …….. (f) $\frac{r}{q}$ = ……..

8. Here is a drawing of a stegosaurus. If the diagram is drawn to a scale of 1:120, what is the approximate length of this dinosaur? Give your answer in appropriate units.



Answer:……

9. Write down the next two terms in each of the following sequences:

(a) 5, 9, 13, 17, 21,……

(b) 1, 3, 9, 27, 81,……

(c) $\frac{19}{4}, \frac{17}{9}, \frac{15}{16}, \frac{13}{25}, \frac{11}{36}$, ……

10. Simplify:

(a) ab – ba ……..

(b) 4(5n +6 –n) ……..

(c) p – 8p + 17p ……..

(d) 5(3d + 7) + 4(2d – 7) ……..

11. Write each of the following numbers correct to two decimal places:

(a) 65.4632 = …… (b) 0.055 = …… (c) 9.8971 = ……

SAMPLE

12. A group of boys buy 250 grams of chocolate chewies. The chewies cost c pence for 10 grams. Write down the total cost in terms of c .

Answer:.....

If there are k boys in the group and they share the cost equally, how much does each boy pay?

Answer:.....

13. 240 passengers are checking in at Gatwick Airport for a flight to Kuala Lumpur. 90% of them are British nationals. How many passengers is this?

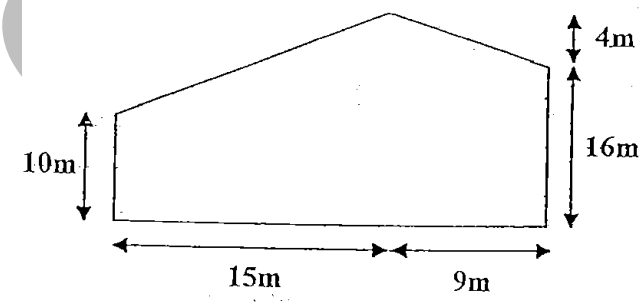


Answer:.....

The ratio of men to women on the flight is 5:3. How many women are there?

Answer:.....

14. This is a drawing of the end wall of a factory. The dimensions are shown in metres.

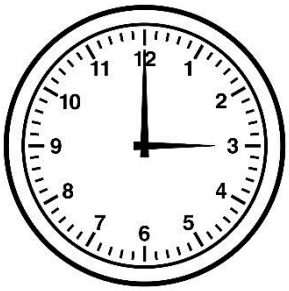


Find, by calculation, the area of this end wall.

Answer:.....

SAMPLE

15. Find the angle between the hour hand and minute hand of a clock at each of the following times:



(a) Four o'clock ……

(b) Half past six ……

(c) Twenty past five ……

Can you write down a time between 10:30 and 11 o'clock when the angle between the hands is exactly 25 degrees?

Answer:……..

16. $p = n^2 - n + 41$

Draw up a table showing the value of p for all whole number values of n from 1 to 10 inclusive. In how many of these cases is p prime?

SAMPLE

Answers to 13+ Sample Questions

1. a) 5 b) 7 c) £84 d) 15cm
2. 54912
3. a) 4 b) -1/5 c) 14 d) 8
4. 5/9, 60
5. 1/25, 4%; 0.125, 12.5%; 1.63, 1 63/100; 0.2, 20%
6. a=147° + reason; b=50°, c=100° + reasons
7. a) 75 b) 125 c) -10 d) 70 e) -120 f) -6
8. 8.4m
9. a) 25, 29 b) 243, 729 c) 9/49, 7/64
10. a) 0 b) 16n+24 c) 10p d) 23d+7
11. a) 65.46 b) 0.06 c) 9.90
12. 25c, 25c/k
13. 216, 90
14. $387m^2$
15. a) 120° b) 15° c) 40°; 10:50
16. 41,43,47,53,61,71,83,97,113,131 – all prime.

SAMPLE