



WHITGIFT

SAMPLE QUESTIONS
for
13+ OPEN ENTRANCE EXAMINATION
MATHEMATICS

CALCULATORS ARE NOT ALLOWED

1. Work out the following:

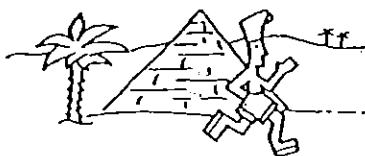
(a) $17 - 2(5 + 1) = \dots\dots\dots$

(b) $15\% \text{ of } \pounds 560 = \dots\dots\dots$

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

(d) $\frac{5}{8} \text{ of } 24\text{cm} = \dots\dots\dots$

2. The Ancient Egyptians used a system of units in which 96 *digits* make up 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) $5x - 1 = 19$

(b) $3x = 42$

answer (a)

answer (b)

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

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

answer (c)

answer (d)

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.

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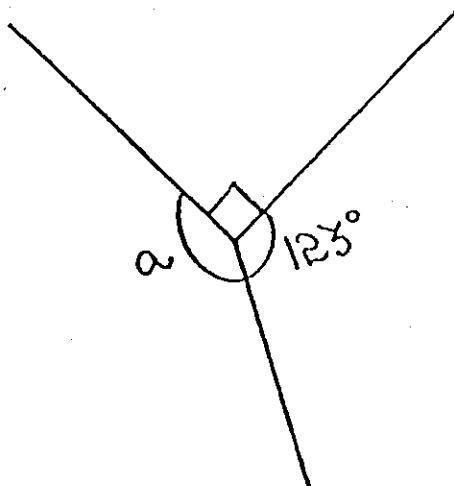
If there are in fact 108 beads in the bag, *how many* of them are turquoise?

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

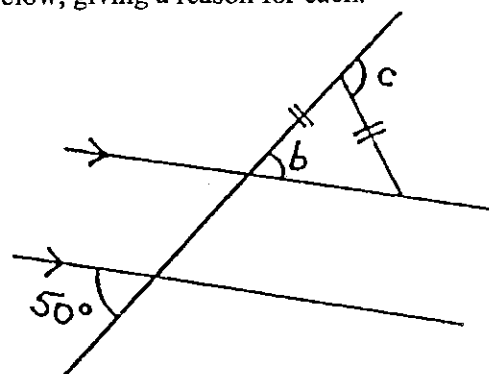
Decimal	Fraction	Percentage
0.25	$\frac{1}{4}$	25%
0.04		
	$\frac{1}{8}$	
		163%
	$\frac{3}{5}$	

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



$a = \dots\dots\dots$

Reason:



$b = \dots\dots\dots$

Reason:

$c = \dots\dots\dots$

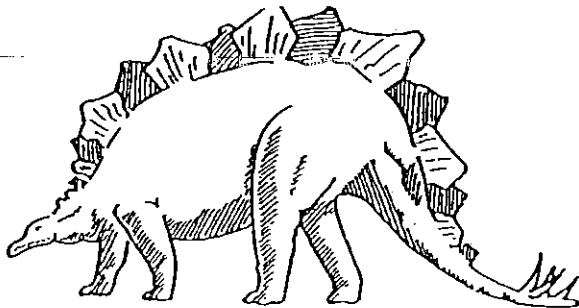
Reason:

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

(a) $3p^2 = \dots\dots\dots$ (b) $q^p = \dots\dots\dots$ (c) $pqr = \dots\dots\dots$

(d) $p^3 = \dots\dots\dots$ (e) $(p-q)(r+q) = \dots\dots\dots$ (f) $\frac{r}{q} = \dots\dots\dots$

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

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) $65.4632 = \dots\dots\dots$ (b) $0.055 = \dots\dots\dots$ (c) $9.8971 = \dots\dots\dots$

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 .

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

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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?

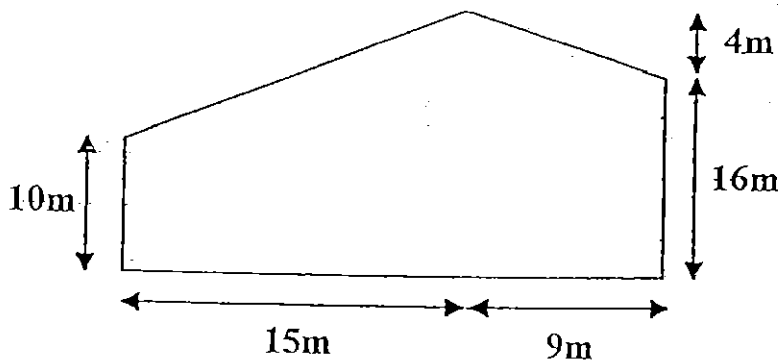
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The ratio of men to women on the flight is 5:3. How many women are there?

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

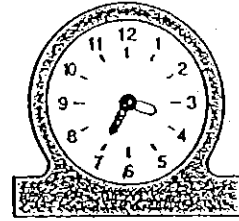


Find, by calculation, the area of this end wall.

answer:

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?

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?