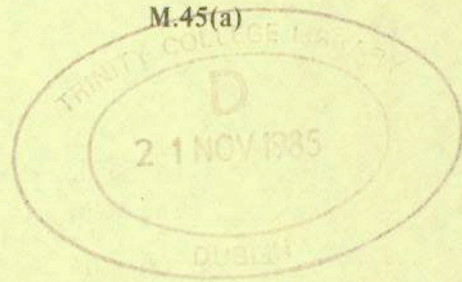


AN ROINN OIDEACHAIS
 INTERMEDIATE CERTIFICATE EXAMINATION, 1985
 MATHEMATICS - LOWER COURSE - PAPER I (150 marks)
 THURSDAY, 13 JUNE - MORNING, 9.30 to 12.00

M.45(a)



SECTION A (45 marks)

Examination Number

Attempt all questions. You should not spend more than 45 minutes on this section. Answer each question by writing one of (a), (b), (c), (d) in the box under each question number. If you wish to change an answer, cross out your first choice and write your new answer near the box.

Mathematical tables may be obtained from the Superintendent.

THIS PAPER MUST BE ENCLOSED IN YOUR ANSWER BOOK

1. $\frac{3}{4} - (\frac{1}{4} - 1) =$

(a) $-\frac{1}{2}$

(b) 0

(c) $\frac{1}{2}$ (d) $1\frac{1}{2}$

2. $0.5 \times 0.25 =$

(a) 1.25

(b) 0.75

(c) 0.125

(d) 0.0125

3. IR£80 + 12½% VAT in IR£ is

(a) 70

(b) 88

(c) 90

(d) 112.50

4. The area of one face of a cube is 4 cm². The volume of the cube in cm³ is

(a) 64

(b) 16

(c) 12

(d) 8

5. A car travels 36 km in 45 minutes. This speed in km per hour is

(a) 63

(b) 48

(c) $36\frac{3}{4}$

(d) 27

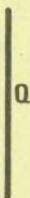
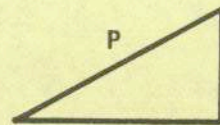
6. Q is the image of P under

(a) an axial symmetry

(b) a central symmetry

(c) a projection

(d) no one of these

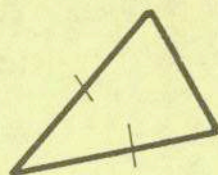


7. Which one of the following has no axis of symmetry?

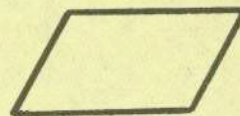
(a)



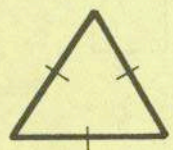
(b)



(c)

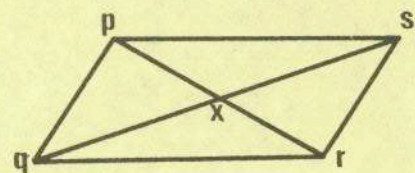


(d)



8. $pqrs$ is a parallelogram.

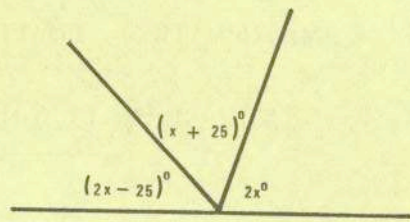
Which one of the following is false?

(a) $(p, q) \uparrow (s, r)$ (b) $(s, x) \uparrow (x, q)$ (c) $(r, x) \uparrow (p, x)$ (d) $(q, r) \uparrow (p, s)$ 

OVER →

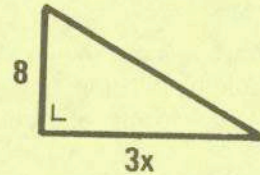
9. The angles measure $2x^\circ$, $(x + 25)^\circ$, $(2x - 25)^\circ$.
The value of x is

- (a) 30 (b) 36
 (c) 45 (d) 60



10. The area of the triangle is 48.
The value of x is

- (a) 6 (b) 4
 (c) 3 (d) 2

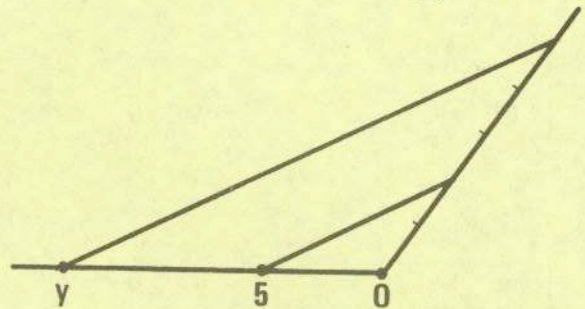


11. $(23^\circ 28' + 17^\circ 42') =$

- (a) 47° (b) $41^\circ 10'$ (c) $40^\circ 10'$ (d) 40°

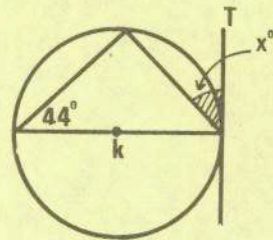
12. y is

- (a) 15 (b) $12\frac{1}{2}$
 (c) 12 (d) 10



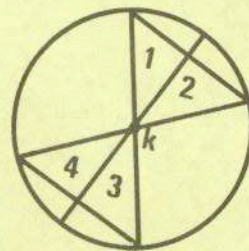
13. T is a tangent and k is the centre of the circle.
The value of x is

- (a) 90° (b) 88°
 (c) 46° (d) 44°



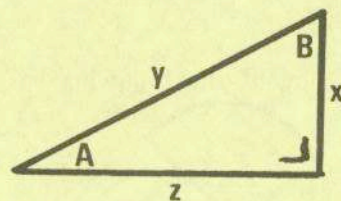
14. The image of the triangle 1 under the central symmetry in k , the centre of the circle, is the triangle

- (a) 1 (b) 2 (c) 3 (d) 4



15. Which one of the following is true ?

- (a) $\sin A = \frac{y}{x}$ (b) $\sin B = \frac{z}{y}$
 (c) $\cos A = \frac{x}{y}$ (d) $\cos B = \frac{z}{x}$



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SECTION B (105 marks)

Attempt QUESTION 1 (30 marks) and THREE other questions (25 marks each)

Marks may be lost if all your work is not clearly shown

1. (a) Calculate the value of

$$\frac{8(7.14 - 19.14)}{6(4.28 + 5.72)}$$

- (b) Use your Tables, p.20 to p.27, or otherwise to evaluate

$$(i) \sqrt{4.347} \quad (ii) \frac{1}{0.03472} \quad (iii) \sqrt{100(17.35)^2}$$

- (c) Mary earns IR£10 500 per year.

IR£3500 is free of tax.

IR£4000 is taxed at 35%.

The remainder of her salary is taxed at 45%.

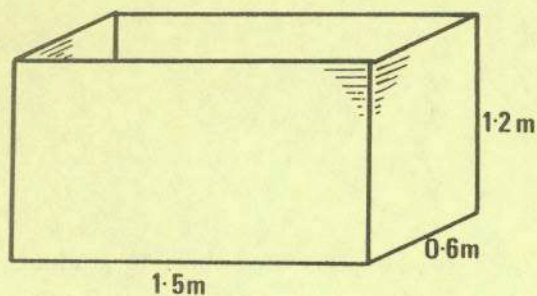
How much tax does she pay ?

2. Calculate the number of litres in
- 1 m^3
- .

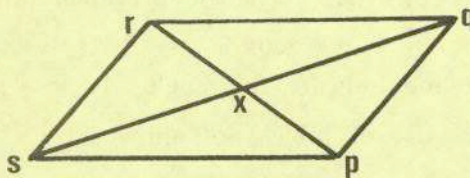
A rectangular tank has measurements as in diagram.

If heating oil costs 29.3p per litre, calculate the cost of a tank full of oil.

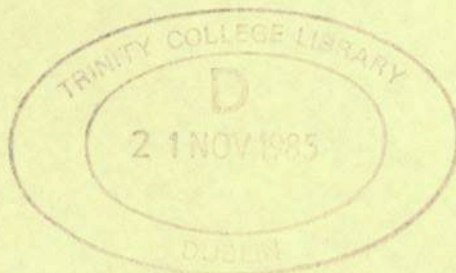
In a seven day period the level of oil in the tank dropped by 5 cm. Calculate the average cost per day of the oil used.



- 3.
- $pqrs$
- is a parallelogram.

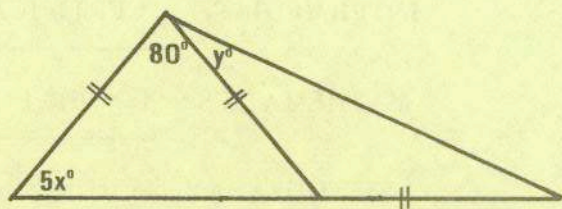


- Name a couple that is equipollent to (s, x) and a couple equipollent to (p, s) .
- Write down the image of EACH of the points r, x, q under the central symmetry in x .
- Use the result of (ii) to write down one pair of angles that are equal in size.
- Say why
area of $\Delta xrs =$ area of Δxqp .
- If area of $\Delta xrs = k$, express in terms of k the area of the parallelogram.



4. If two sides of a triangle are equal in length, prove that the angles opposite these sides are equal in measure.

Calculate the value of x and the value of y .



5. Construct a square of side 6 cm and letter it as in diagram.

Measure the length of $[sq]$.

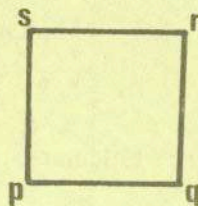
Construct a Δptq such that

t is on the line which is perpendicular to sq and which contains p

and

area of $\Delta ptq =$ area of the square.

Find two positions for t .



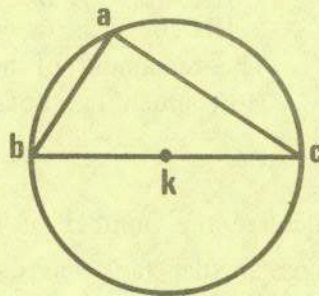
6. Prove that the diameter of a circle which is perpendicular to a chord of the circle bisects the chord.

k is the centre of the circle.

The distance of k from ac is 5.

The distance of k from ab is 8.

Calculate to the nearest whole number the length of the diameter.



7. (a) Use your tables to evaluate

(i) $\sin 30^\circ + \sin 55^\circ$

(ii) $\sin(30 + 55)^\circ$.

- (b) Construct a triangle in which one angle, A , is such that

$$\cos A = \frac{1}{3}$$

and indicate this angle A .

(Use of tables not allowed.)

- (c) $[qr]$ is the diameter of the circle of centre k .

8 and x indicate the lengths of two line segments.

Calculate the value of x .

