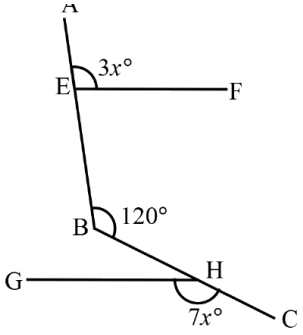
1. (a) Without using tables or calculators, simplify: (0.6 × 32 × 0.004) / (1.2 × 0.008 × 0.16). Leaving your answer in standard form (scientific notation).

(b) In the diagram, EF is parallel to GH. If ∠AEF = 3x°, ∠ABC = 120° and ∠CHG = 7x°, find the value of ∠GHB.



- $\sqrt{12} + \sqrt{108}$, leaving the answer in surd fc

, find n.

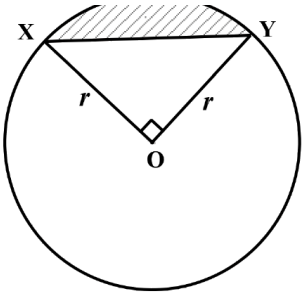
2. (a) Simplify 3√75 – √12 + √108, leaving the answer in surd form (radicals).

(b) If $124_n = 232_{five}$, find n.

3. (a) Solve the simultaneous equations: 1/x + 1/y = 5 and 1/y – 1/x = 1.

(b) A man drives from Ibadan to Oyo, a distance of 48 km, in 45 minutes. If he drives at 72 km/h where the surface is good and 48 km/h where it is bad, find the number of kilometres of good surface.

4. (a) In the diagram, O is the centre of the circle radius r cm and ∠XOY = 90°. If the area of the shaded part is 504 cm², calculate the value of r. [Take π = 22/7]



es PQR and PQS are drawn on oppos
nd $\angle PSQ = 190°$, calculate the value c

lered for two independent contracts, X
.5 and not win contract Y is 0.3. What i

(b) Two isosceles triangles PQR and PQS are drawn on opposite sides of a common base PQ. If ∠PQR = 66° and ∠PSQ = 190°, calculate the value of ∠RQS.

5. A building contractor tendered for two independent contracts, X and Y. The probability that he will win contract X is 0.5 and not win contract Y is 0.3. What is the probability that he will win:

(a) both contracts;

(b) exactly one of the contracts;

(c) neither of the contracts?

6. (a) If 3 / (2p – 1/2) = (1/2) / ((1/4)p + 1), find p.

(b) A television set was marked for sale at GHC 760.00 in order to make a profit of 20%. The television set was actually sold at a discount of 5%. Calculate, correct to 2 significant figures, the actual percentage profit.

7. (a) Copy and complete the table for the relation $y = 2 \sin x + 1$.

x	0°	30°	60°	90°	120°	150°	180°	210°	240°	270°
y	1.0				2.7			0.0	–0.7	

(b) Using a scale of 2 cm to 30° on the x-axis and 2 cm to 1 unit on the y-axis, draw the graph of $y = 2 \sin x + 1$ for $0° \leq x \leq 270°$.

(c) Use your graph to find the value of x for which $\sin x = 1/4$.

8. (a) Copy and complete the following table for multiplication modulo 11.

⊗	1	5	9	10
1	1	5	9	10
5	5			
9	9			
10	10			

Use the table to:

i. evaluate $(9 \otimes 5) \otimes (10 \otimes 10)$;

ii. find the truth set of

α. $10 \otimes m = 2$;

β. $n \otimes n = 4$.

(b) When a fraction is reduced to its lowest term, it is equal to 3/4. The numerator of the fraction when doubled would be 34 greater than the denominator. Find the fraction.

9. (a) In the Venn diagram, P, Q and R are subsets of the universal set U. If n(U) = 125, find:

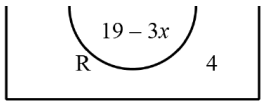
1	1	5	9	10
5	5			
9	9			
10	10			

$\otimes 5) \otimes (10 \otimes 10)$;
h set of
$= 2$;
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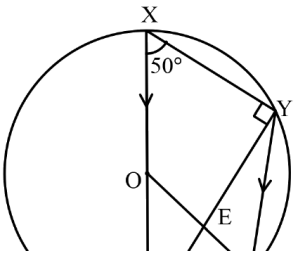
i. the value of x;

ii. $n(P \cup Q \cup R')$.

(b) In the diagram, O is the centre of the circle. If WX is parallel to YZ and $\angle WXY = 50°$, find the value of:



P, Q and R are subsets of the universal



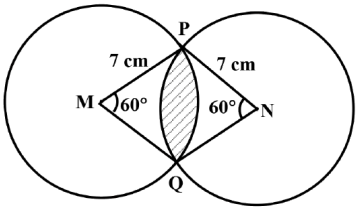
i. ∠WYZ;

ii. ∠YEZ.

10. (a) Solve: (x – 2)(x – 3) = 12

(b) In the diagram, M and N are centres of the two circles of equal radii 7 cm. The circles intercept at P and Q. If ∠PMQ = ∠PNQ = 60°, calculate correct to the nearest whole number, the area of the shaded portion. [Take π = 22/7]

M and M are centres of the two circles of equal
ıd Q. If $\angle PMQ = \angle PNQ = 60°$, calculate corre
ı of the shaded portion. $\left[\text{Take } \pi = \frac{22}{7}\right]$



distribution of outcomes when a die is thrown 50

11. The table shows the distribution of outcomes when a die is thrown 50 times.

Scores	1	2	3	4	5	6
Frequency	2	5	13	11	9	10

Calculate the:

(a) mean deviation of the distribution;

(b) probability that a score selected at random is at least a 4.

12. (a) Given that 5 cos(x + 8.5)° – 1 = 0, 0° ≤ x ≤ 90°, calculate correct to the nearest degree, the value of x.

(b) The bearing of Q from P is 150° and the bearing of P from R is 015°. If Q and R are 24 km and 32 km respectively from P:

i. represent the information in a diagram;

ii. calculate the distance between Q and R, correct to two decimal places;

iii. find the bearing of R from Q correct to the nearest degree.

13. (a) Two functions f and g are defined by f : x → 2x² – 1 and g : x → 3x + 2, where x is a real number.

i. If f(x – 1) – 7 = 0, find the value of x.

ii. Evaluate: f(–1/2) – g(3)

iii. Evaluate: f(4) – g(5)

(b) An operation * is defined on the set ■ of real numbers by m * n = n / (m² + 1), where m, n ∈ ■. If –3, –10 ∈ ■, show whether or not * is commutative.