

**S3 HOMEWORK**

**SETS 1 and 2**

**HW1 INTEGERS**

1. Calculate

(a)  $-5 \times 8$     (b)  $-2 - 11$     (c)  $-9 \times (-4)$     (d)  $18 \div (-3)$

(e)  $21 - (-5)$     (f)  $-54 \div (-6)$     (g)  $-7 + (-9)$     (h)  $-7 \times (-6)$

2. Simplify

(a)  $5a + (-2a)$

(b)  $-3p \times 4q$

(c)  $(-7r) \times (-7r)$

(d)  $\frac{-5y \times (-6y)}{-3}$

3. Work out the answers to the following:-

(a)  $((-17) - 13) \div 3$

(b)  $5 \times (-2) \times (-4)$

(c)  $(-2a) \times (-6a)$

(d)  $(-7)^2$

(e)  $(-4)^2 - (-2)^3$

**HW2 DISTRIBUTIVE LAW/SIMPLIFYING EXPRESSIONS**

1. Multiply out the brackets

(a)  $9(a + 5)$

(b)  $7(y - 8)$

(c)  $4(w + 9)$

(d)  $15(6 - c)$

2. Multiply out the brackets

(a)  $x(x + 2)$

(b)  $a(ab + 3c)$

(c)  $3m(8 - m)$

(d)  $2y^2(w - 5y)$

3. Multiply out the brackets and simplify

(a)  $3(x + 7) + 2x$

(b)  $16y - 5(2y + 3)$

(c)  $7(5x - 2) - 13$

4. Multiply out these brackets

(a)  $(x + 4)(x + 7)$

(b)  $(y - 9)(y - 3)$

(c)  $(x + 12)(x - 2)$

(d)  $(2a + 5)(a + 9)$

(e)  $(3w - 8)(2w + 1)$

(f)  $(4x - 3)^2$

### HW3 EVALUATING EXPRESSIONS AND FORMULAE

1. If  $a = 4$ ,  $b = -3$  and  $c = 9$  find the value of the following
- (a)  $ab + c$                       (b)  $-(bc)$                       (c)  $\frac{b+c}{a}$
- (d)  $-a(b+c)^2$                       (e)  $b^2 - c$                       (f)  $(ab)^2$
- (g)  $c^2 - b$                       (h)  $a^2 - 2b$

2. Evaluate each formula for the given values:-

(a)  $V = \frac{4}{3} \pi r^3$  when                      (i)  $r = 3$                       (ii)  $r = 5$

(b)  $s = ut + \frac{1}{2} at^2$  when                      (i)  $u = 20$ ,  $a = 5$ ,  $t = 3$

(ii)  $u = 30$ ,  $a = -5$ ,  $t = 4.5$

3. To convert a Fahrenheit temperature (F) into celsius (C) the formula

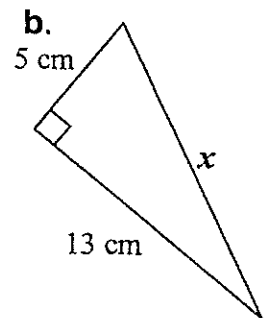
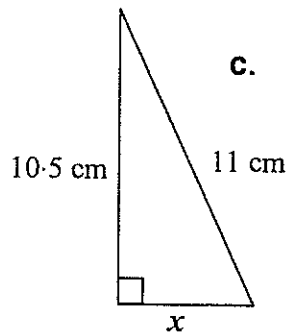
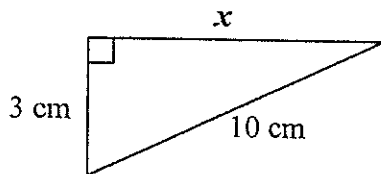
$$C = \frac{5(F - 32)}{9} \text{ is used}$$

Find C when F is:- (a) 167                      (b) 23

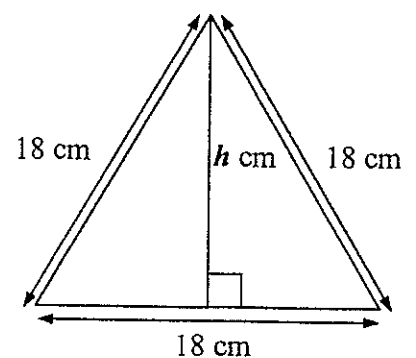
### HW4 PYTHAGORAS' THEOREM

1. Calculate the length of the side marked  $x$  in each of these right angled triangles:

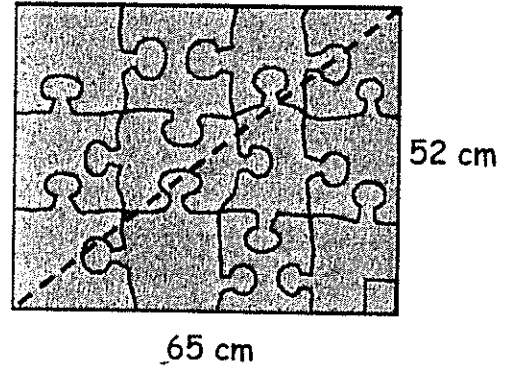
a.



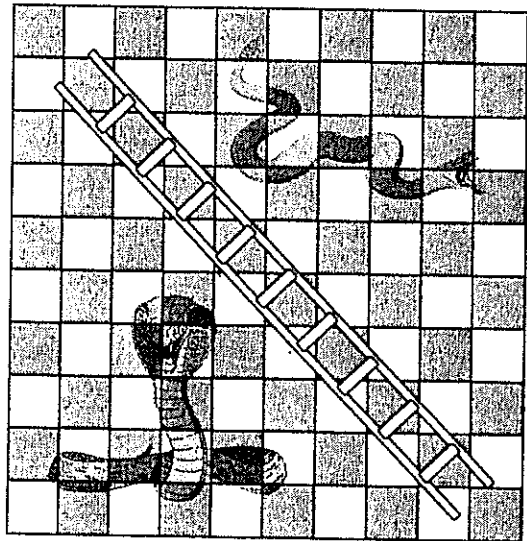
2. An equilateral triangle can be split into two identical (congruent) right angled triangles, as shown here  
Calculate the height,  $h$  cm, of an equilateral triangle whose sides are each 18 cm long.



3. A rectangular jigsaw measures 65 cm by 52 cm.  
Will it fit onto a circular table with diameter 80 cm?

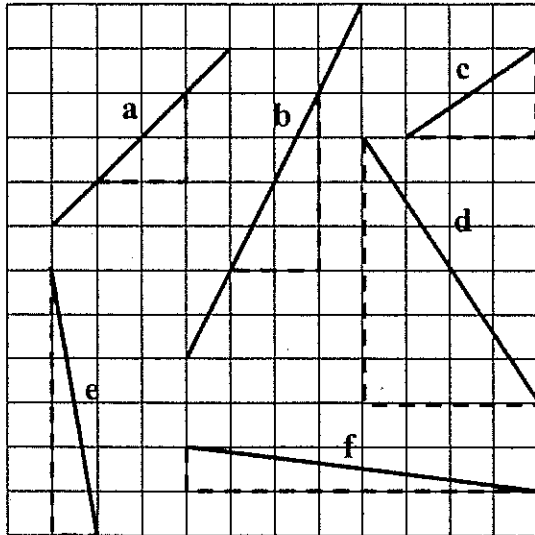


4. A square snakes & ladders board has 100 squares and a diagonal of length 35 cm.  
Find the length of side of one of the small squares.



**HW5 STRAIGHT LINE GRADIENTS**

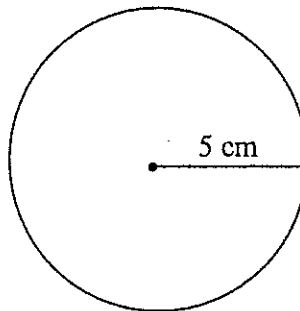
1. Find the **gradients** of the lines shown in the diagram below



2. Calculate the gradient of :-
- (a) the line AB which passes through the points A(-2,-1) and B(3,4)
  - (b) the line CD which passes through the points C(-6,5) and D(4,-5)

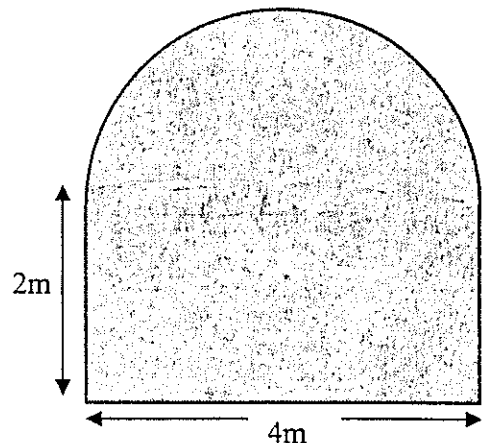
**HW6 AREA AND CIRCUMFERENCE OF A CIRCLE**

1. Find the circumference and area of this circle



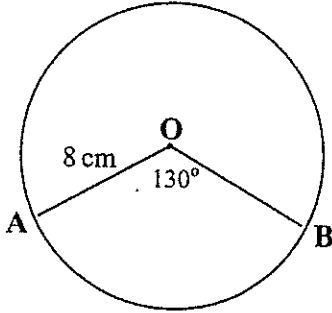
2. A window is in the shape of a rectangle, 4m by 2m with a semicircle of diameter 4m on top.

Find the area of glass in the window.

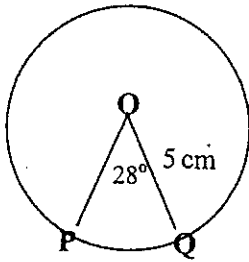


### HW7 ARCS AND SECTORS

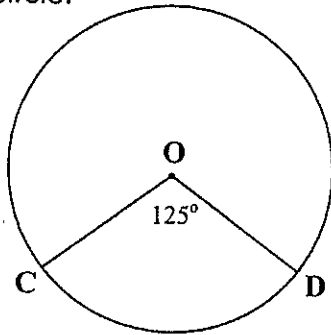
Q1. Find the length of the minor arc AB in the circle below.



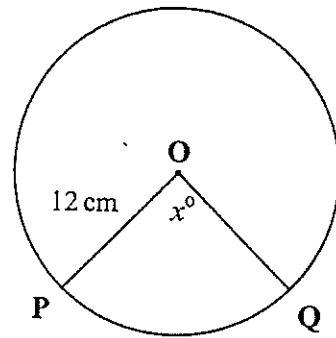
Q2. Find the length of the major arc PQ in the circle below.



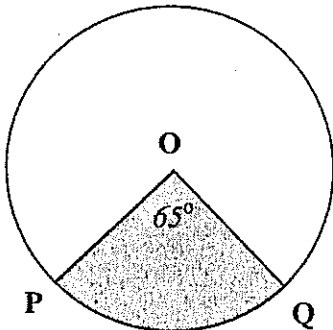
Q3. The length of arc CD is 8.8 cm. Calculate the circumference of the circle.



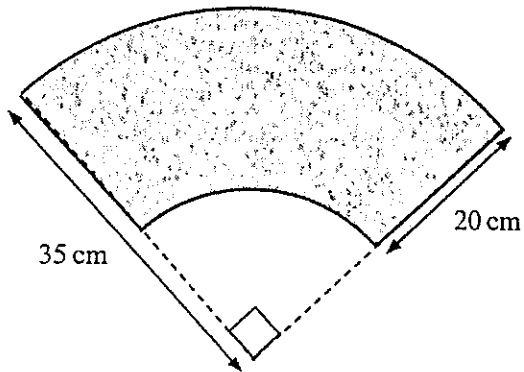
Q4. The area of sector OPQ is  $100\text{cm}^2$ . Calculate the size of angle  $x$ .



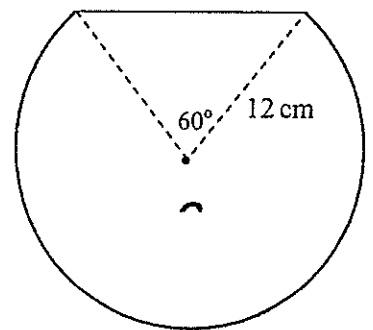
Q5. The area of the shaded sector is  $36.3\text{cm}^2$ . Calculate the area of the circle.



- Q6.** Ornamental paving slabs are in the shape of part of a sector of a circle. Calculate the area of the slab shown.



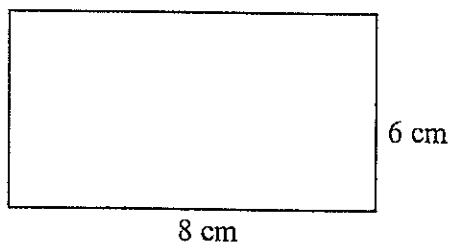
- Q7.** The diagram shows the logo for the Westminster Wine Glass Company. Find the perimeter of the top part of the logo.



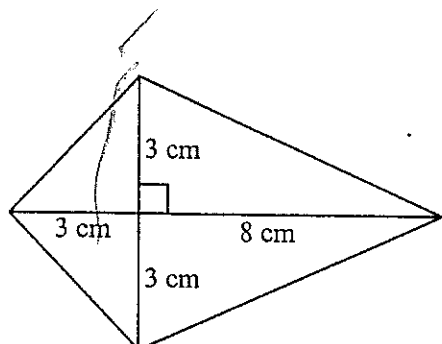
### HW 8 AREA OF QUADRILATERALS

- Q1.** Find the area of each shape shown below. *Show all your working.*

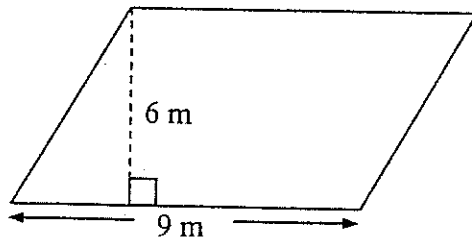
(a)



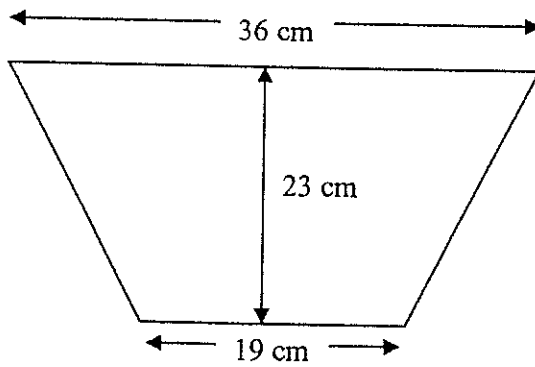
(b)



(c)



(d)



### HW9 FRACTIONS, DECIMALS AND PERCENTAGES

- Write these percentages as common fractions  
(a) 70%                      (b) 17%                      (c) 75%                      (d) 66 $\frac{2}{3}$ %
- Write these percentages as decimal fractions  
(a) 15%                      (b) 3%                      (c) 49%                      (e) 3.6%
- Work these out  
(a) 10% of 120              (b) 30% of 60              (c) 25% of 84,  
(d) 1% of 90              (e) 40% of 600              (f) 38% of 950
- Copy and complete the bill  
Electricity charges    £212.68  
VAT @ 8%                £  
TOTAL                        £
- Calculate Terry's percentage mark in his recent maths test when he scored 35 out of 40.

## HW 10 PERCENTAGES (Extension)

- 1 The Smiths buy a house for £60 000. If it appreciates in value at the rate of 9% per year, how much will it be worth in 5 years time?
- 2 In 2010 the world population was estimated to be 5300 million, and was increasing at the rate of 1.7% per annum.  
What will the population be in the year 2020? (answer to 2 significant figures)
- 3 Peter buys a car for £3000. If it depreciates at the rate of 20% per annum, how much will he be able to sell it for in 3 years time/
- 4 I bought a camera for £200 and sold it for £145.  
(a) How much of a loss did I make?  
(b) Express the loss as a percentage of what it cost.
- 5 The shop's sale sign said '**20% off everything**'.  
Jane bought a denim jacket in the sale for £24.  
What would it have cost Jane before the sale?
- 6 When he reached 14, David's dad increased his weekly pocket money by 25%.  
David's pocket money then went up to £15.  
How much did he get per week when he was only 13?