

NAME:

TEACHER:

# THE SCOTS COLLEGE



YEAR 11

## 2 UNIT MATHEMATICS ASSESSMENT

6<sup>TH</sup> MARCH 2007

TIME ALLOWED: 50 MINUTES

WEIGHTING: 15%

### INSTRUCTIONS:

- SHOW ALL NECESSARY WORKING.
- APPROVED NON-PROGRAMMABLE CALCULATORS MAY BE USED.
- ANSWER EACH QUESTION ON A SEPARATE SHEET.

QUESTION	OUTCOME	MARKS AVAILABLE	MARKS OBTAINED
1, 2	P3 Performs routine arithmetic and algebraic manipulation involving surds, simple rational expressions and trigonometric identities.	16	
3	P5 Understands the concept of a function and the relationship between a function and its graph.	12	
4	P4 Chooses and applies appropriate arithmetic, algebraic, graphical, trigonometric and geometric techniques.	13	
	TOTAL	41	

QUESTION 1 [9 MARKS] [ANSWER ON A SEPARATE SHEET]

MARKS

(i) Express  $0.45\bar{3}$  as a fraction.

[2]

(ii) Simplify the following:  $12x^3y^2 + -4xy^2$

[2]

(iii) Find  $\sqrt{8^2 + (-3)^2}$  giving the answer correct to 3 decimal places.

[2]

(iv) Show that  $\frac{5}{\sqrt{2}-1} + \frac{1}{7-5\sqrt{2}}$  is rational.

[3]

QUESTION 2 [7 MARKS] [ANSWER ON A SEPARATE SHEET]

Solve:

(i)  $|x-1| < 4$  and plot this on a number line.

[1]

(ii)  $\frac{4x+3}{6x-5} = \frac{2x-1}{3x+2}$

[2]

(iii) Factorise  $8b^3 + 27$

[2]

(iv) Solve  $3x^2 + 7x - 6 = 0$

[2]

QUESTION 3 [12 MARKS] [ANSWER ON A SEPARATE SHEET]

(i) If  $f(x) = \begin{cases} -2x & \text{if } x < -1 \\ x+3 & \text{if } -1 \leq x \leq 3 \\ 6 & \text{if } x > 3 \end{cases}$  find  $f(-3) + f(0) + f(5)$ .

(ii) Find the domain and range of each of the following functions:

(a)  $y = -\sqrt{4-x^2}$

(b)  $y = \frac{1}{x-3}$

(iii) Sketch the graph  $y = |3x-2|$  and label the intercepts.

(iii) Sketch the region  $y > (x+2)^2, y < x+3$  and label the intercepts.

MARKS

[2]

[2]

[2]

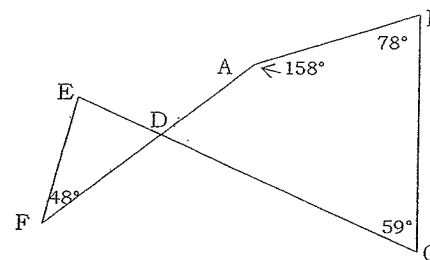
[2]

[4]

QUESTION 4 [13 MARKS] [ANSWER ON A SEPARATE SHEET]

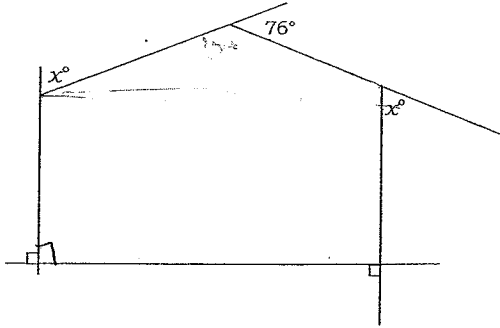
(i) Find  $\angle DEF$

[3]

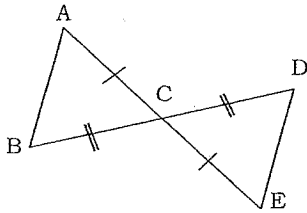


[QUESTION 4 CONTINUES]

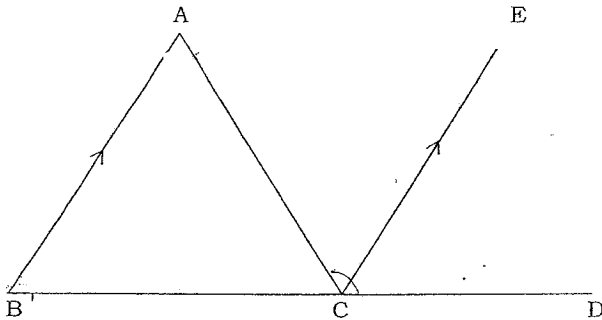
(ii) Find the value of  $x$ .



(iii) Prove that the pair of triangles are congruent.



(iv)



ABC is a triangle in which BC is produced to D and CE is drawn parallel to BA.

Prove  $\angle ACD = \angle BAC + \angle ABC$

[QUESTION 4 CONTINUES]

(v) You are given the following information:

$$AB \parallel GF \parallel DC$$

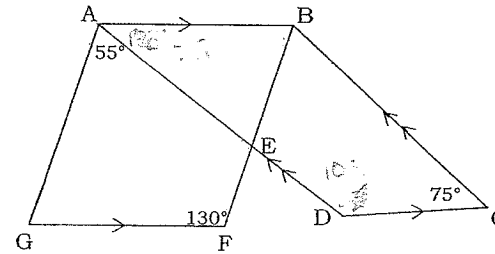
$$AD \parallel BC$$

$$\angle BCD = 75^\circ$$

$$\angle BFG = 130^\circ$$

$$\angle GAD = 55^\circ$$

Show that  $AG \parallel BF$



[2]

[2]

[3]

[3]