Name: _____ Class: _____

St George Girls High School

Year 9

Common Test #2

July 2005

Algebra / Indices
Equations / Inequ's
Geometry
Data Presentation
Trigonometry

Mathematics

Advanced Course

Time Allowed: 70 minutes

Instructions:

- All questions may be attempted.
- All necessary working must be shown.

Part A

Multiple Choice

Circle the letter for the answer that gives the best response to each question (1 mark each)

1. The radius of a circle with circumference 25.13cm, correct to the nearest whole number, is:

    A. 2

    B. 3

    C. 4

    D. 6

2. Which of the following is <u>not</u> a rational number:

    A. $\sqrt{9}$

    B. $\sqrt{3}$

    C. 0.3

    D. $0.\dot{3}$

3. The parallel sides of a trapezium are 11cm and 17cm. If the area of the trapezium is 182cm^2 how far apart are the parallel sides? (Correct to the nearest whole number.)
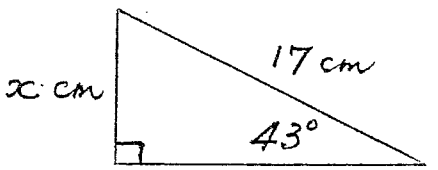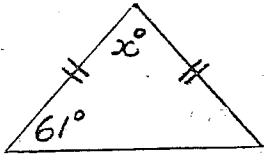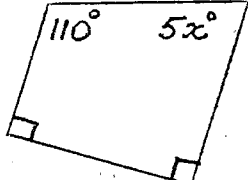
    A. 1cm

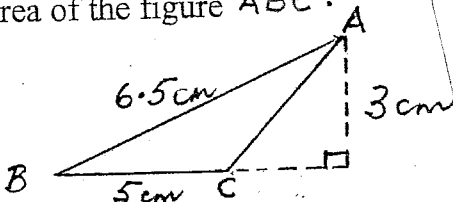   B. 7 cm

    C. 11cm

    D. 13cm

4. Ordinary conversation of relative intensity of 10^6 is 60 on the decibel scale. A noise that is 100 times as intense has a decibel scale of:

A. 80

B. 600

C. 10^8

D. 1000100

5. Which of the following is <u>not</u> equal to $2a$?

A. $a + a$

B. $a \times 2$

C. $3a - a$

D. $2a^2 - a$

6. A formula for calculating the number of days, n, that fresh milk will keep at different temperatures, $t°$, above freezing is $n = \dfrac{6}{t+1}$.

How much longer will milk keep at $1°$ than $5°$?

A. 1 day

B. 2 days

C. 3 days

D. 4 days

Part B

Use the **Question** column for working. (1 mark each)
Only write answers in the **Answers only** column

Question	Answers
1. Write $3m^{-2}$ with a positive index.	
2. Simplify $\left(5^2\right)^3 \times \left(5^4\right)^{-1}$	
3. Find the value of x if $2^x = 32$	
4. Evaluate giving your answer with 2 figure accuracy $$\frac{\left(4 \cdot 9 \times 10^7\right) \times \left(3 \cdot 8 \times 10^3\right)}{6 \cdot 29 \times 10^{-4}}$$	
5. Write 'five times a number x is always greater than 8' in algebraic form.	
6. Which of $x = 3$, $x = -5$, $x = -8$ are solutions to the inequality $3x - 5 > 2$	
7. Find correct to two decimal places the value of x in	
8. A speed skater travels 4000m in 5 minutes. What is the average speed in km/hour.	

Question	Answers
9. Find the value of x in $x°$ $61°$	
10. A regular polygon has an exterior angle of $18°$ how many sides does it have?	
11. Do the following unit conversions: a) 40mm = _____ cm b) 400000g = _____ t c) 0.04km = _____ mm d) 400cm^2 = _____ m^2	a) _____ b) _____ c) _____ d) _____
12. Find the value of x $110°$ $5x°$	
13. Simplify $6m - 2n + 5m + 3n$	
14. Expand and simplify $x(x-1) - 5(2x+3)$	
15. Find the area of the figure ABC : A $6.5cm$ $3cm$ B $5cm$ C	
16. Factorise fully $12n^3 - 8n^2$	

Part C

Show all necessary working.

Question 1 (13 marks)

a) Solve the following:

(i) $5x - 3 = 17$

(ii) $5d - 8 = 4 + 3d$

(iii) $4w - 3(2w + 5) = 3(w - 2)$

(iv) $\dfrac{4}{m-2} = \dfrac{5}{m}$

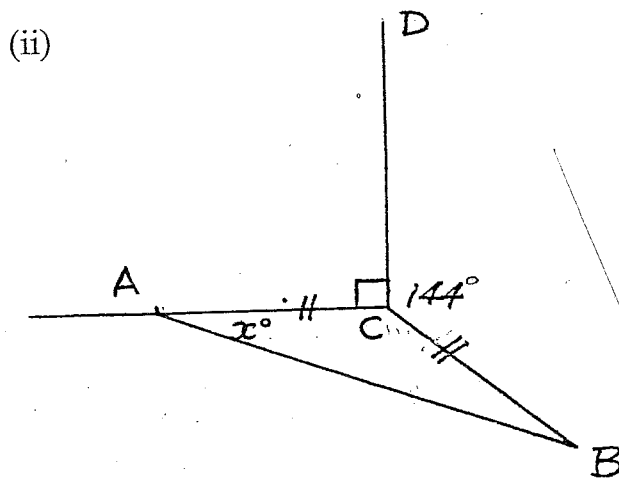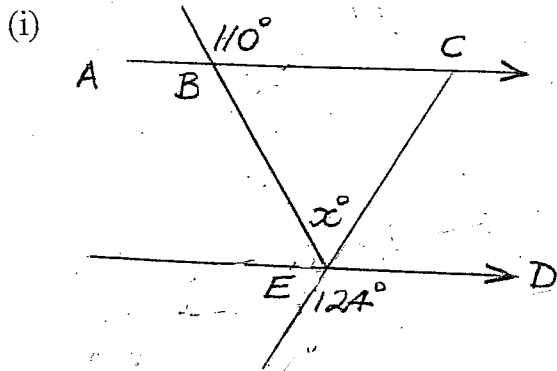b) Solve the following and graph the solution on the number line.

(i) $5x - 6 > -8$

(ii) $10x - 2(3 + 4x) \geq 2 - 3(5 - x)$

c) Make n the subject of the formula $4p = \dfrac{5}{n+2}$
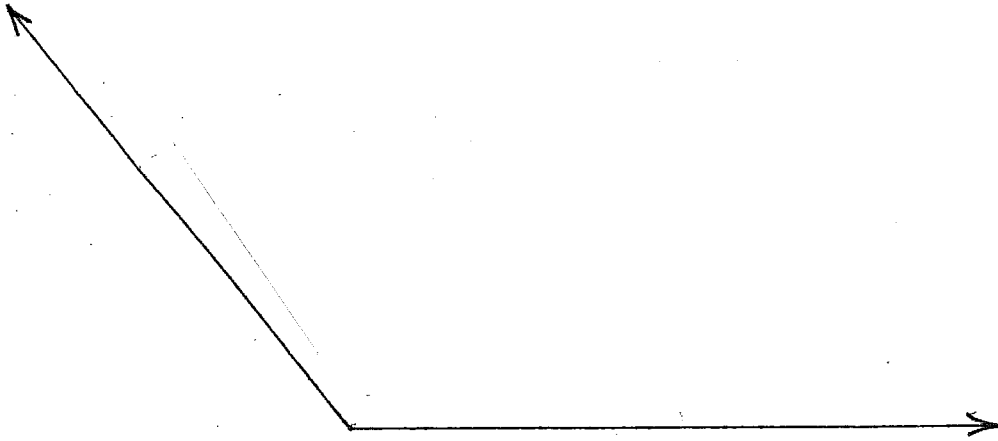
Question 2   (13 marks)

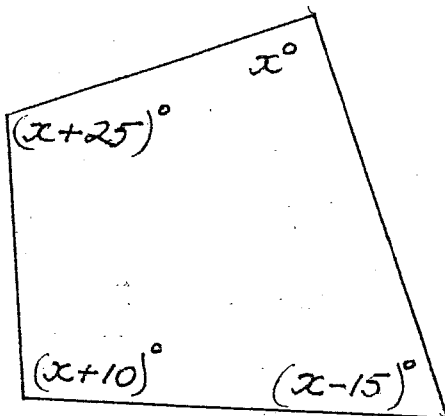a)   Find the value of x giving reasons.

(i)

(ii)

b)   List the quadrilaterals whose diagonals bisect each other at right angles.

Question 2 (cont'd)

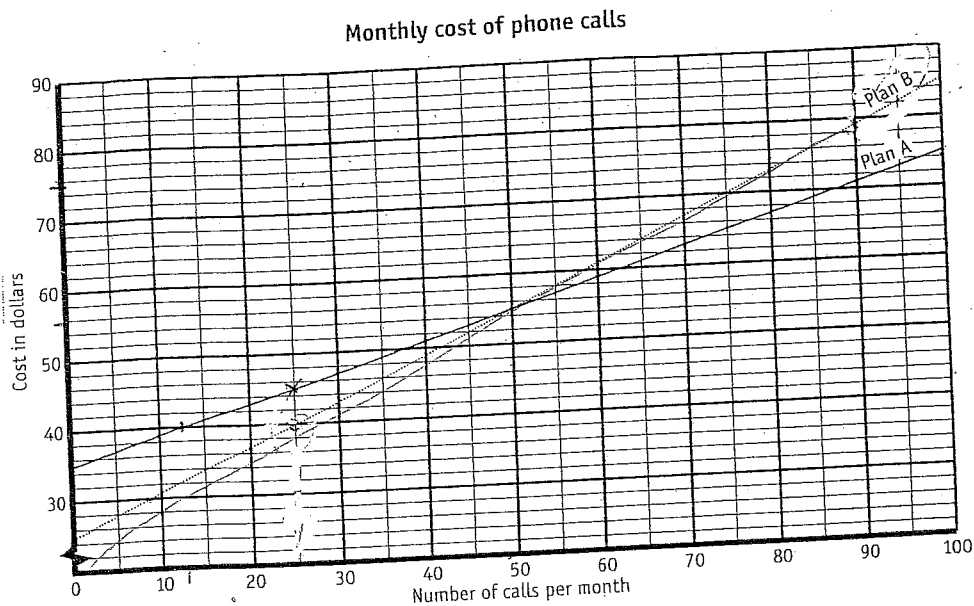c)   Use construction instruments to bisect the angle drawn.

d)   Find the value of x

x°

$(x+25)^\circ$

$(x+10)^\circ$

$(x-15)^\circ$

Question 3 (13 marks)

a) This graph compares the monthly cost of telephone calls and the service fee on Plan A and Plan B. The prices are based on a 2-minute phone call at local off-peak rate. Use this graph to help you answer the following questions.

Monthly cost of phone calls

(i) John uses Plan A. How much will it cost him if he makes 100 2-minute calls in a month?

(ii) Joanne belongs to Plan B. Her bill last month was $40. How many 2-minute phone calls did she make?

(iii) Clement uses Plan A and Stuart uses Plan B. When they received their bills they found they had made the same number of calls and they had to pay the same amount. How many phone calls had they each made and how much did they both have to pay?

(iv) Rowena knows she will only make about 30 phone calls per month. Would you recommend that she use Plan A or Plan B?
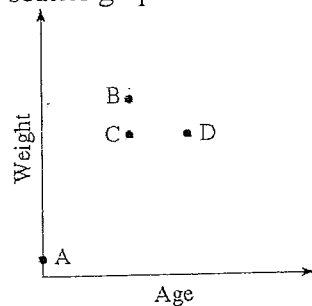
Question 3 (cont'd)

b) Ben caught the bus to go up the hill to the shop, bought his groceries, then walked home. Which of these distance-time graphs is most likely to illustrate this?

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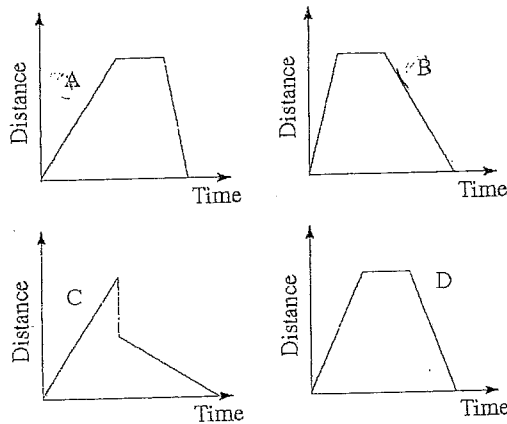
c) Tom has twin brothers Jack and Zac, and a new baby brother, Harry. Jack is heavier than Zac, and Tom weighs the same as one of the twins. Match each letter in the scatter graph with each boy.
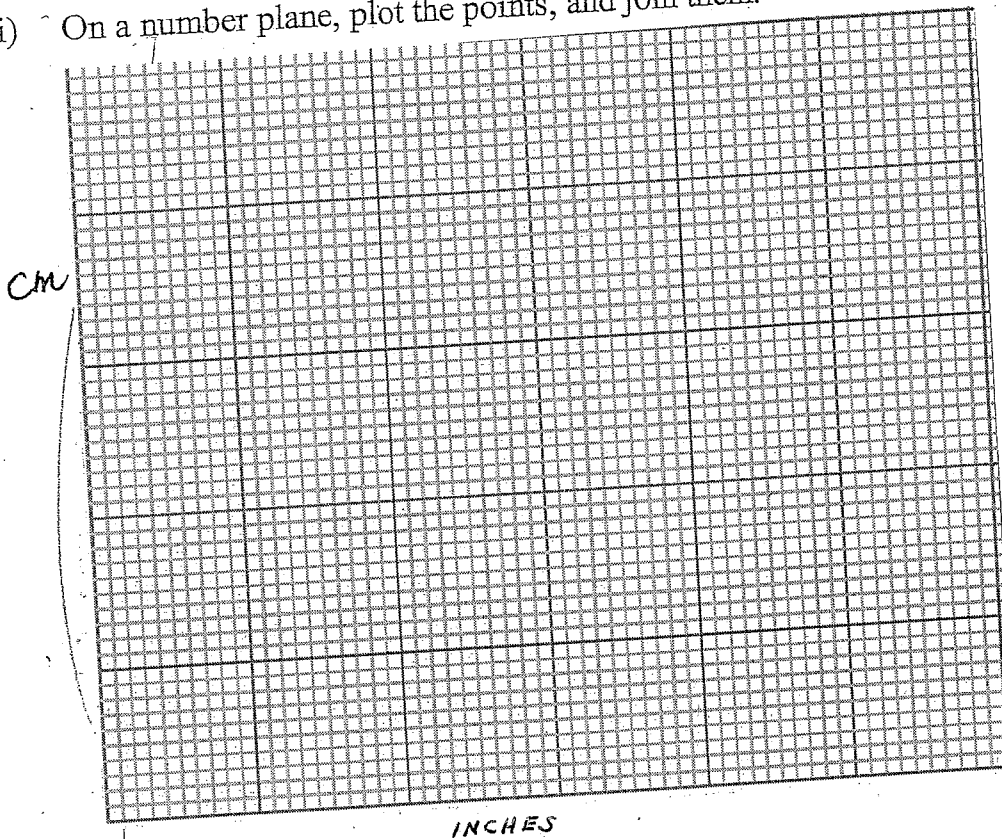
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Question 3 (cont'd)

d) The table below gives equivalent measurements in inches and centimetres.

Inches	0	5	10	15	20
Cm	0	12.7	25.4	38.1	50.8

(i) On a number plane, plot the points, and join them.
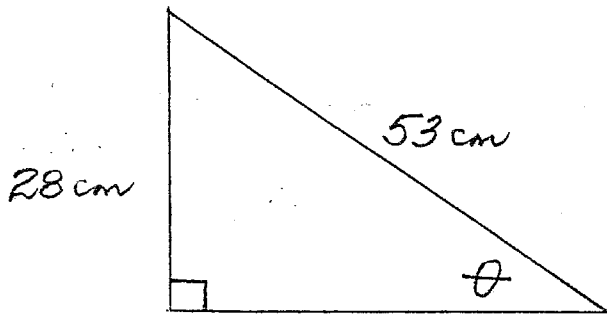

(ii) Estimate from your graph.

1. 7 inches = _____ cm

2. 7 cm = _____ inches

(iii) Suzanne is 160cm tall. Estimate this height in inches

Question 4 (13 marks)
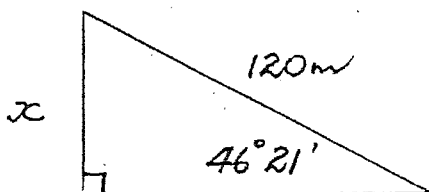
a)   Find the exact value of $\tan\theta$

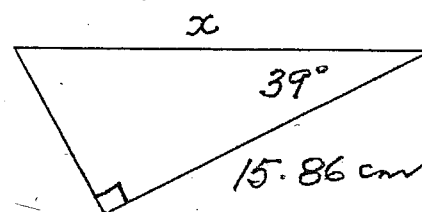b)   Write the value of $\cos 67°24'$ correct to 3 decimal places.

c)   If $\sin\theta = 0.635$ write the value   of θ in degrees and minutes.

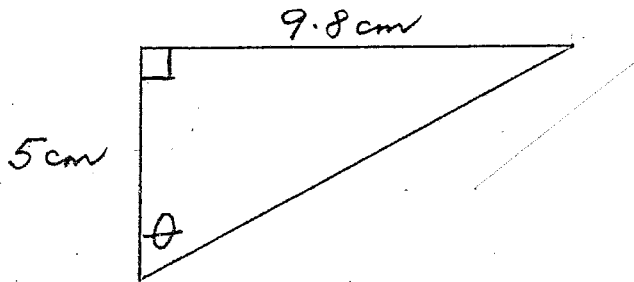d)   Evaluate the value of x in the figures below to the nearest integer.

(i)

(ii)

Question 4 (cont'd)

e) Find θ in degrees and minutes.

f) From the top of a cliff 7m high the angle of depression of a boat out to sea is $4°30'$

   (i) Draw a diagram to illustrate the situation.

   (ii) How far is the boat from the foot of the cliff, to the nearest 10m?

End of Paper

ANSWERS TO ST GEORGE GIRLS H.S.
JULY 2005 COMMON TEST #2

SECTION A

1	C	2	B	3	D	4	A	5	D	6	B

SECTION B

1	$\dfrac{3}{m^2}$	2	25	3	$x = 5$	4	3.0×10^{14}	5	$5x > 8$
6	$x = 3$	7	$11.59\,\text{cm}$	8	48 km/h	9	$x = 58^0$	10	20
11a	4	b	0.4	c	40 000	d	0.04	12	14^0
13	$11m + n$	14	$x^2 - 11x - 15$	15	7.51	16	$4n^2(3n-2)$		

SECTION C

1 a i	$x = 4$	ii	$d = 6$	iii	$w = -\dfrac{9}{5}$	iv	$m = 10$	b i	$x > -\dfrac{2}{5}$
ii	$x \le 7$	c	$n = \dfrac{5 - 8p}{4p}$						
2 a i	$x = 54$	ii	$x = 27$	b	Rhombus, square	c	Check	d	$x = 85$
3 a i	\$75	ii	25	iii	50, \$55	iv	Plan B	b	B
c	A:Harry B:Jack C:Zac D:Tom	d i	Check	ii		iii	63 inches		
4 a	$\dfrac{28}{45}$	b	0.384	c	$39^0 25'$	d i	87 m	ii	20 cm
e	$62^0 58'$	f i	Check	ii	90 m				

- **Updated 11/05**