

# DAPTO HIGH SCHOOL



## YEAR 11 HALF YEARLY EXAMINATION

# MATHEMATICS

## 2003

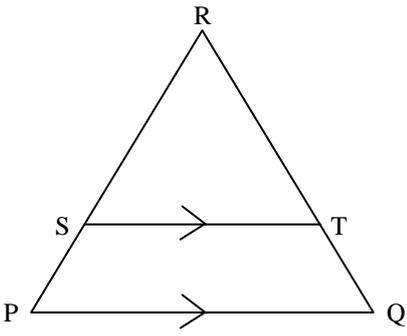
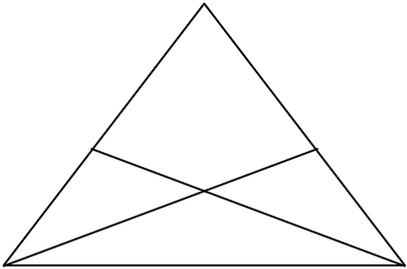
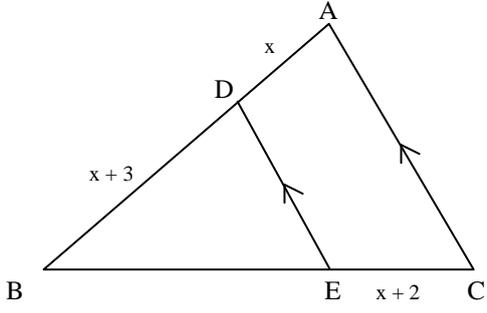
*Time Allowed: 75 MINUTES*

### INSTRUCTIONS:

- Show all necessary working
- Answers must be done of your own paper
- Start a new page for each question
- Board approved calculators may be used
- Marks may be deducted for careless or poorly arranged work

Question 1 (11 marks)	
<p>1. Evaluate <math>\frac{34.6}{\sqrt{(5.1)^2 + (3.9)^2}}</math></p> <p>2. Write <math>0.4\bar{8}</math> in the form <math>\frac{a}{b}</math> (<math>b \neq 0</math>)</p> <p>3. Simplify <math>\sqrt{48} - \sqrt{20} + \sqrt{12} + \sqrt{125}</math></p> <p>4. Find the integers a and b such that <math>(7 - \sqrt{3})^2 = a + b\sqrt{3}</math></p> <p>5. Express <math>3\sqrt{5}</math> as an entire surd</p> <p>6. Rationalise the denominator of</p> <p>(a) <math>\frac{2}{\sqrt{11}}</math>                      (b) <math>\frac{4}{\sqrt{5} - 2}</math></p>	<p>1</p> <p>2</p> <p>2</p> <p>2</p> <p>1</p> <p>a) 1 b) 1</p>
Question 2 (20 marks)	
<p>1. Factorise completely</p> <p>(a) <math>25y^2 - 4x^2</math>                      (b) <math>y^2 - 5y - 36</math></p> <p>(c) <math>12a^2 + 11a + 2</math>                      (d) <math>54 - 2x^3</math></p> <p>(e) <math>e^2 - 5a - ab + 5b</math></p> <p>2. Simplify <math>\frac{5}{6} - \frac{x-1}{4}</math></p> <p>3. Find all possible solutions to these equations</p> <p>(a) <math> x - 3  = 8</math>                      (b) <math> 2x + 6  = 3x - 1</math></p> <p>(c) <math>7x^2 - 7 = 0</math>                      (d) <math>5x^2 + 13x - 6 = 0</math></p> <p>4. Solve <math>2x^2 - 9x + 3 = 0</math> by any suitable method. Give your answer as a surd in simplest form</p> <p>5. Solve <math> 2x - 3  &lt; 9</math> and graph your solution on a number line</p>	<p>a) 1 b) 1 c) 1 d) 2 e) 1</p> <p>2</p> <p>a) 2 b) 2 c) 2 d) 2</p> <p>2</p> <p>2</p>

Question 3 (16 marks)	
1. Evaluate the following. Give answers correct to 4 significant figures (a) $138.9 \sin 49^\circ 19'$ (b) $\frac{38.07}{\tan 16^\circ 53'}$	a) 1 b) 1
2. If $0^\circ < \theta < 90^\circ$ , find $\theta$ in degrees and minutes if (a) $\cos \theta = 0.2471$ (b) $\sin \theta = \frac{17 \sin 59^\circ 23'}{36.2}$	a) 1 b) 1
3. ABCD is a rectangle in which $AB = 18\text{cm}$ and $\angle ABD = 35^\circ$ (a) Draw a diagram to show this information (b) Find the length of the diagonal BD (correct to 2 decimal places)	a) 1 b) 2
4. A ship sails from a port A 72km south and then 39km west (a) Draw a diagram to show this information (b) Use the diagram and knowledge of trigonometry to find the bearing of the ship from port A. (Answer correct to the nearest minute)	a) 1 b) 2
5. Find the <b>exact</b> values of the following: (a) $4 \sin 60^\circ \cos 60^\circ$ (b) $2 \tan 30^\circ$ (c) $\tan^2 45^\circ - \sin^2 45^\circ$	a) 2 b) 2 c) 2

Question 4	(9 marks)	
1.	 <p>In <math>\Delta PQR</math>, <math>PQ \parallel ST</math></p> <p>(a) Prove <math>\Delta PQR</math> is similar to <math>\Delta STR</math></p> <p>(b) If <math>RS = 5\text{cm}</math>, <math>SP = 3\text{cm}</math>, <math>RT = 3.5\text{cm}</math> Calculate the length of <math>RQ</math></p>	<p>2</p> <p>2</p>
2.	 <p><math>BX</math> and <math>CY</math> are altitudes of <math>\Delta ABC</math></p> <p><math>\angle ABC = \angle ACB</math></p> <p>(a) Draw the diagram and mark on all information</p> <p>(b) Prove <math>BX = CY</math></p>	<p>1</p> <p>2</p>
3.	 <p><math>DE \parallel AC</math></p> <p>Show that <math>x</math> can take two values. Find them</p>	<p>2</p>