

Name:

Maths Class:

SYDNEY TECHNICAL HIGH SCHOOL



YEAR 9 ASSESSMENT

Mathematics

September 2014

TIME ALLOWED: 20 minutes for PART A
45 minutes for PART B

Instructions:

- Write your name and class at the top of this page,
- Detach the Multiple Choice sheet for section A from the back of this bundle. You have 20 minutes to complete this section, and it will be handed in after the 20 minutes.
- Calculators may be used in all parts of this examination.
- Marks may not be awarded for careless or badly arranged work.

(MARKERS' USE ONLY)

Multiple Choice SECTION A	/15
Short Answer SECTION B	/40
TOTAL	/55


SECTION A

MULTIPLE CHOICE

On the answer sheet provided, fill in the answer of your choice. If you make a mistake, cross it out, as shown on the back of the title page of this document, and clearly mark your correct response.

All questions in this section are worth 1 mark

The answer sheet for this section is to be handed in after 20 minutes

1	<p>The value of $2\sin 30^\circ =$</p> <p>A. $\sin 60^\circ$ B. 0.732 C. 0.8660 D. 1</p>
2	<p>The expansion of $(x - 3)^2 =$</p> <p>A. $x^2 - 9$ B. $x^2 + 9$ C. $x^2 - 6x + 9$ D. $x^2 - 3x + 9$</p>
3	<p>$\frac{x}{4} - \frac{2x}{3} =$</p> <p>A. $-\frac{5x}{12}$ B. $-\frac{x}{12}$ C. $-x$ D. $\frac{5x}{12}$</p>
4	<p>$(2a^3)^4 =$</p> <p>A. $2a^7$ B. $16a^7$ C. $2a^{12}$ D. $16a^{12}$</p>
5	<p>  </p> <p>The mathematical description of this number line solution, is:</p> <p>A. $x > -2$ B. $x \geq -2$ C. $x < -2$ D. $x \leq -2$</p>
6	<p>In a normal deck of 52 cards, a card is drawn, and it is noted that it is a red Jack. The card is returned to the deck and the deck is shuffled. A second draw is then made. What is the probability that it is also a red Jack?</p> <p>A. $\frac{1}{52}$ B. $\frac{1}{51}$ C. $\frac{2}{51}$ D. $\frac{1}{26}$</p>

7	<p>Fully factorised, $4x^2 - 25y^2 =$</p> <p>A. $(4x - 5y)^2(x - y)$</p> <p>B. $(2x - 5y)^2$</p> <p>C. $(2x - 5y)(2x + 5y)$</p> <p>D. $(4x - 5y)(x - y)$</p>
8	<p>Expanding $(x - 2)(x^2 + 2x + 4)$ gives:</p> <p>A. $x^3 - 8$ B. $x^3 + 8$ C. $x^3 - 2x^2 - 4x - 8$ D. $x^3 + 2x^2 + 4x - 8$</p>
9	<p>Fully factorised, $a^2 + ab - 2a - 2b =$</p> <p>A. $(a + b)(a - 2)$</p> <p>B. $(a^2 + b)(a - 2)$</p> <p>C. $(a^2 - 2)(a + b)$</p> <p>D. $(a - b)(a + 2)$</p>
10	<p>John's class has had 5 class tests out of 50 and he is averaging 60%.</p> <p>In the next test, he scores 45 out of 50.</p> <p>He is now averaging:</p> <p>A. 60% B. 65% C. 90% D. there is insufficient information</p>
11	<p>From a normal 52-card deck of cards, a card is drawn and <u>not returned</u>.</p> <p>Another card is drawn.</p> <p>The probability that it is of the same suit as the first card is:</p> <p>A. $\frac{3}{13}$ B. $\frac{4}{17}$ C. $\frac{1}{3}$ D. $\frac{1}{4}$</p>

12	<p>In a large city of population of over a million, the ratio of men to women is 8:7. A job comes up in a nearby city, and 120 men leave to go to that second city. The ratio of men to women in the first city is now:</p> <p>A. 1:1</p> <p>B. 6:7</p> <p>C. 8:7</p> <p>D. it cannot be determined without knowing the original population</p>
13	<p>If $V = \frac{4}{3}\pi r^3$, then $r =$</p> <p>A. $\sqrt[3]{\frac{3V}{4\pi}}$</p> <p>B. $\sqrt[3]{\frac{4\pi}{3V}}$</p> <p>C. $\left(\frac{3V}{4\pi}\right)^3$</p> <p>D. $\left(\frac{4\pi}{3V}\right)^3$</p>
14	<p>Another way to write $\frac{1}{\sqrt[3]{a}}$ is:</p> <p>A. $a^{\frac{1}{3}}$</p> <p>B. $a^{-\frac{1}{3}}$</p> <p>C. $a^{\frac{3}{2}}$</p> <p>D. $a^{-\frac{3}{2}}$</p>
15	<p>If $x + \frac{1}{x} = 6$, then $x^2 + \frac{1}{x^2} =$</p> <p>A. 4</p> <p>B. 34</p> <p>C. 35</p> <p>D. 36</p>

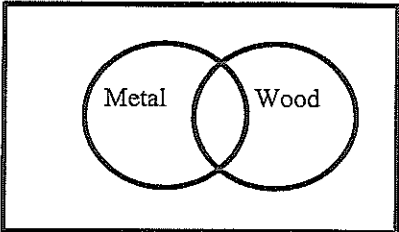
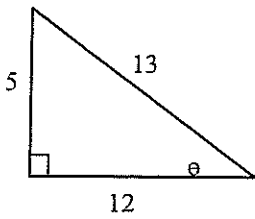
SECTION B

Write your answer in the space provided at right.

Each question is worth 1 mark

Time allowed for this section is 45 minutes

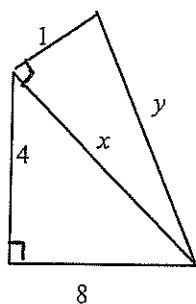
Answer

1	Fully factorise $3ax - 2a + 3x - 2$	
2	Solve $3(x - 4) = 5$	
3	Solve $\frac{x+4}{2} = \frac{1}{4}$	
4	<p>In a class of 30, only 5 do not do metalwork or woodwork. 18 in total do metalwork, while 16 do woodwork.</p> <p>How many do woodwork but not metalwork?</p> <p><i>You should use the Venn Diagram provided to answer the question.</i></p>	
5	<p>Simplify:</p> $\frac{\sqrt{36x^2}}{4x}$	
6	<p>In the diagram below find the <u>exact</u> value of $\cos \theta$</p> <p style="text-align: center;">DIAGRAM NOT TO SCALE</p> 	
7	Find, to the nearest minute, the value of α if $\tan \alpha = 1.5$	

8	Which of these statistics is the best indicator of the spread of a set of scores: mean, median or range													
9	Simplify $\frac{5x-5y}{5}$													
10	Solve $\sqrt{2x+1} = 3$													
11	Solve $x(x+5) = x^2 - 4$													
12	The histogram for a set of scores is shown at right. Draw on it the <i>ogive</i> .	<table><caption>Histogram Data</caption><thead><tr><th>Score</th><th>Cumulative Frequency</th></tr></thead><tbody><tr><td>11</td><td>1</td></tr><tr><td>12</td><td>3</td></tr><tr><td>13</td><td>6</td></tr><tr><td>14</td><td>10</td></tr><tr><td>15</td><td>15</td></tr></tbody></table>	Score	Cumulative Frequency	11	1	12	3	13	6	14	10	15	15
Score	Cumulative Frequency													
11	1													
12	3													
13	6													
14	10													
15	15													

The next 2 questions refer to the diagram below.

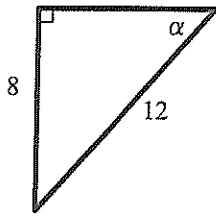
Do not use trigonometry to do this question



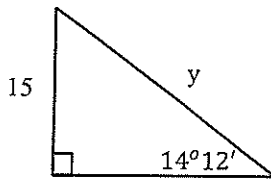
13	Find the <u>exact</u> value of x	
14	Find the exact value of y	

15	4 cards of the same shape and size are numbered 3, 5, 6 and 7. The cards are shuffled and laid out from left to right in random order to form a 4-digit number. What is the probability that the number formed is greater than 7 000?																																									
16	For the following set of scores, give the median <table><tr><th>Score (<i>x</i>)</th><th>Frequency (<i>f</i>)</th><th>Cumulative frequency (<i>cf</i>)</th></tr><tr><td>12</td><td>2</td><td></td></tr><tr><td>13</td><td>5</td><td></td></tr><tr><td>14</td><td>9</td><td></td></tr><tr><td>15</td><td>9</td><td></td></tr><tr><td>16</td><td>3</td><td></td></tr><tr><td>17</td><td>1</td><td></td></tr></table>	Score (<i>x</i>)	Frequency (<i>f</i>)	Cumulative frequency (<i>cf</i>)	12	2		13	5		14	9		15	9		16	3		17	1																					
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12	2																																									
13	5																																									
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16	3																																									
17	1																																									
17	In the question above, how many scores were there under 16?																																									
18	Fully factorise $x^2 - 5x - 6$																																									
19	Solve for <i>x</i> : $3-7x \geq 17$																																									
20	This stem and leaf plot gives the test scores for Mr. Matt Ematics' class: <table><tr><td>2</td><td> </td><td>1</td><td>2</td><td>5</td><td></td><td></td><td></td></tr><tr><td>3</td><td> </td><td>0</td><td>5</td><td>6</td><td>8</td><td>9</td><td></td></tr><tr><td>4</td><td> </td><td>2</td><td>3</td><td>5</td><td>6</td><td>7</td><td>8</td></tr><tr><td>5</td><td> </td><td>0</td><td>1</td><td>3</td><td>8</td><td></td><td></td></tr><tr><td>6</td><td> </td><td>2</td><td>5</td><td>8</td><td></td><td></td><td></td></tr></table> What is the median test score?	2		1	2	5				3		0	5	6	8	9		4		2	3	5	6	7	8	5		0	1	3	8			6		2	5	8				
2		1	2	5																																						
3		0	5	6	8	9																																				
4		2	3	5	6	7	8																																			
5		0	1	3	8																																					
6		2	5	8																																						

21

Find the value of α to the nearest degree.DIAGRAM NOT
TO SCALE

22

Find the value of y to 1 decimal place:DIAGRAM NOT
TO SCALE

23

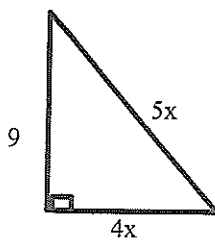
Simplify $\frac{2x-1}{5} + \frac{1-2x}{4}$

24

For the set of scores below, what is the mean ?

Score (x)	frequency (f)	fx
25	2	
26	5	
27	10	
28	8	
29	1	
30	2	
31	2	
	$\Sigma f =$	$\Sigma fx =$

25

Find the exact value of x in the diagram below:

26	Simplify $\frac{3x+3y}{xy+y^2}$	
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The following 2 questions refer to the diagram below

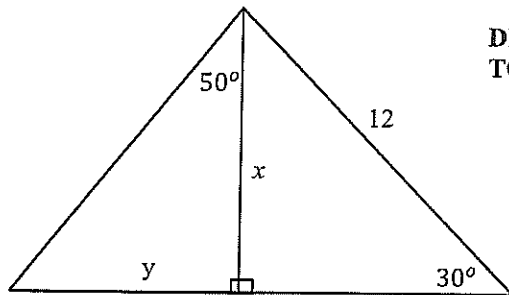


DIAGRAM NOT
TO SCALE

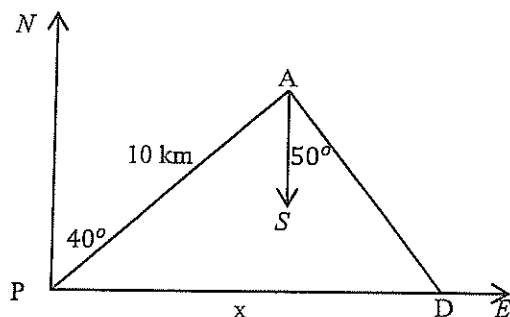
27	Find the value of x	
28	Find the value of y to 1 dec. place	

29	Simplify $\frac{x^2-9}{3} \div \frac{x+3}{6}$	
30	Solve the following inequality $\frac{5x}{2} - 4 > 4x - 7$	
31	Plot the solution to question above on the number line provided.	\longleftrightarrow

32	Simplify $\frac{1}{a} - \frac{1}{a^2}$	
33	Solve for x: $\frac{1}{x+1} = \frac{x+1}{x^2+5}$	
34	Simplify $\frac{2x+4}{x-y} \times \frac{x^2-y^2}{2x+2y}$	

The next 3 questions refer to the information and diagram below:

The diagram below represents the course sailed by a ship, leaving a port P, and sailing on a course of $N40^\circ E$ for 10km. It then resets its course to $S50^\circ E$ until it is at D which is due East of the port P.



35	Find $\angle PAD$	
36	Find $\angle APD$	
37	How far is the ship (D) away from the port (P) at this time? (Give your answer to the nearest 0.1 kilometre).	

38	<p>Solve the following for x:</p> $\frac{3x + 2}{4} - \frac{x}{3} = \frac{x + 1}{2}$	
39	<p>Completely factorise</p> $x^2 - 2xy + y^2 + x - y$	
40	<p>Simplify</p> $\frac{\frac{x+y}{1} + \frac{1}{x+y}}{\frac{1}{x} + \frac{1}{y}}$	

SYDNEY TECHNICAL HIGH SCHOOL



MATHEMATICS

MULTIPLE CHOICE ANSWER SHEET

Name :

Teacher:

Completely fill the response oval representing the most correct answer.

Remove this sheet from the answer booklet.

1. A ☐ B ☐ C ☐ D ☐
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4. A ☐ B ☐ C ☐ D ☐
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6. A ☐ B ☐ C ☐ D ☐
7. A ☐ B ☐ C ☐ D ☐
8. A ☐ B ☐ C ☐ D ☐
9. A ☐ B ☐ C ☐ D ☐
10. A ☐ B ☐ C ☐ D ☐
11. A ☐ B ☐ C ☐ D ☐
12. A ☐ B ☐ C ☐ D ☐
13. A ☐ B ☐ C ☐ D ☐
14. A ☐ B ☐ C ☐ D ☐
15. A ☐ B ☐ C ☐ D ☐

Name:

Maths Class:

SOLUTIONS

SYDNEY TECHNICAL HIGH SCHOOL



YEAR 9 ASSESSMENT

Mathematics

September 2014

TIME ALLOWED: 20 minutes for PART A
45 minutes for PART B

Instructions:

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- Marks may not be awarded for careless or badly arranged work.

(MARKERS' USE ONLY)

Multiple Choice SECTION A	/15
Short Answer SECTION B	/40
TOTAL	/55


SECTION A

MULTIPLE CHOICE

On the answer sheet provided, fill in the answer of your choice. If you make a mistake, cross it out, as shown on the back of the title page of this document, and clearly mark your correct response.

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2	<p>The expansion of $(x - 3)^2 =$</p> <p>A. $x^2 - 9$ B. $x^2 + 9$ C. $x^2 - 6x + 9$ D. $x^2 - 3x + 9$</p>
3	<p>$\frac{x}{4} - \frac{2x}{3} =$</p> <p>A. $-\frac{5x}{12}$ B. $-\frac{x}{12}$ C. $-x$ D. $\frac{5x}{12}$</p>
4	<p>$(2a^3)^4 =$</p> <p>A. $2a^7$ B. $16a^7$ C. $2a^{12}$ D. $16a^{12}$</p>
5	<p>  </p> <p>The mathematical description of this number line solution, is:</p> <p>A. $x > -2$ B. $x \geq -2$ C. $x < -2$ D. $x \leq -2$</p>
6	<p>In a normal deck of 52 cards, a card is drawn, and it is noted that it is a red Jack. The card is returned to the deck and the deck is shuffled. A second draw is then made. What is the probability that it is also a red Jack?</p> <p>A. $\frac{1}{52}$ B. $\frac{1}{51}$ C. $\frac{2}{51}$ D. $\frac{1}{26}$</p>

7	<p>Fully factorised, $4x^2 - 25y^2 =$</p> <p>A. $(4x - 5y)^2(x - y)$</p> <p>B. $(2x - 5y)^2$</p> <p>C. $(2x - 5y)(2x + 5y)$</p> <p>D. $(4x - 5y)(x - y)$</p>
8	<p>Expanding $(x - 2)(x^2 + 2x + 4)$ gives:</p> <p>A. $x^3 - 8$ B. $x^3 + 8$ C. $x^3 - 2x^2 - 4x - 8$ D. $x^3 + 2x^2 + 4x - 8$</p>
9	<p>Fully factorised, $a^2 + ab - 2a - 2b =$</p> <p>A. $(a + b)(a - 2)$</p> <p>B. $(a^2 + b)(a - 2)$</p> <p>C. $(a^2 - 2)(a + b)$</p> <p>D. $(a - b)(a + 2)$</p>
10	<p>John's class has had 5 class tests out of 50 and he is averaging 60%.</p> <p>In the next test, he scores 45 out of 50.</p> <p>He is now averaging:</p> <p>A. 60% B. 65% C. 90% D. there is insufficient information</p>
11	<p>From a normal 52-card deck of cards, a card is drawn and <u>not returned</u>.</p> <p>Another card is drawn.</p> <p>The probability that it is of the same suit as the first card is:</p> <p>A. $\frac{3}{13}$ B. $\frac{4}{17}$ C. $\frac{1}{3}$ D. $\frac{1}{4}$</p>

12	<p>In a large city of population of over a million, the ratio of men to women is 8:7. A job comes up in a nearby city, and 120 men leave to go to that second city. The ratio of men to women in the first city is now:</p> <p>A. 1:1</p> <p>B. 6:7</p> <p>C. 8:7</p> <p>D. it cannot be determined without knowing the original population</p>
13	<p>If $V = \frac{4}{3}\pi r^3$, then $r =$</p> <p>A. $\sqrt[3]{\frac{3V}{4\pi}}$ B. $\sqrt[3]{\frac{4\pi}{3V}}$ C. $\left(\frac{3V}{4\pi}\right)^3$ D. $\left(\frac{4\pi}{3V}\right)^3$</p>
14	<p>Another way to write $\frac{1}{\sqrt[3]{a}}$ is:</p> <p>A. $a^{\frac{1}{3}}$ B. $a^{-\frac{1}{3}}$ C. $a^{\frac{3}{2}}$ D. $a^{-\frac{3}{2}}$</p>
15	<p>If $x + \frac{1}{x} = 6$, then $x^2 + \frac{1}{x^2} =$</p> <p>A. 4 B. 34 C. 35 D. 36</p>

SYDNEY TECHNICAL HIGH SCHOOL



MATHEMATICS

MULTIPLE CHOICE ANSWER SHEET

Name : SOLUTIONS

Teacher:

Completely fill the response oval representing the most correct answer.

Remove this sheet from the answer booklet.

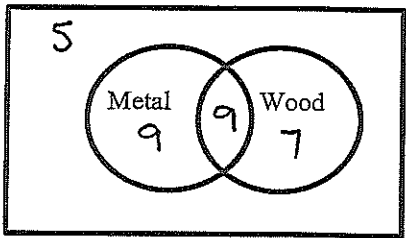
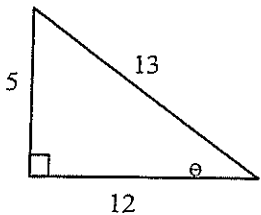
1. A ☐ B ☐ C ☐ D ☒
2. A ☐ B ☐ C ☒ D ☐
3. A ☒ B ☐ C ☐ D ☐
4. A ☐ B ☐ C ☐ D ☒
5. A ☐ B ☐ C ☐ D ☒
6. A ☐ B ☐ C ☐ D ☒
7. A ☐ B ☐ C ☒ D ☐
8. A ☒ B ☐ C ☐ D ☐
9. A ☒ B ☐ C ☐ D ☐
10. A ☐ B ☒ C ☐ D ☐
11. A ☐ B ☒ C ☐ D ☐
12. A ☐ B ☐ C ☒ D ☐
13. A ☒ B ☐ C ☐ D ☐
14. A ☐ B ☒ C ☐ D ☐
15. A ☐ B ☒ C ☐ D ☐

SECTION B

Write your answer in the space provided at right.

Each question is worth 1 mark

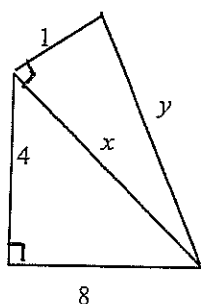
Time allowed for this section is 45 minutes

		Answer
1	Fully factorise $3ax - 2a + 3x - 2$ $a(3x-2) + (3x-2)$	$(3x-2)(a+1)$
2	Solve $3(x-4) = 5$	$1\frac{7}{3}$ or $5\frac{2}{3}$
3	Solve $\frac{x+4}{2} = \frac{1}{4}$	$-1\frac{1}{2}$ or $-3\frac{1}{2}$
4	<p>In a class of 30, only 5 do not do metalwork or woodwork. 18 in total do metalwork, while 16 do woodwork.</p> <p>How many do woodwork but not metalwork?</p> <p><i>You should use the Venn Diagram provided to answer the question.</i></p>	
5	Simplify: $\frac{\sqrt{36x^2}}{4x}$ $\frac{6x}{4x}$	$\frac{3}{2}$ or $1\frac{1}{2}$ or $1\frac{1}{2}$
6	<p>In the diagram below find the <u>exact</u> value of $\cos \theta$</p> <p style="text-align: center;">DIAGRAM NOT TO SCALE</p> 	$\cos \theta = \frac{12}{13}$
7	Find, to the nearest minute, the value of α if $\tan \alpha = 1.5$	$56^\circ 19'$ (must be nearest minute)

8	Which of these statistics is the best indicator of the spread of a set of scores: mean, median or range	Range
9	Simplify $\frac{5x-5y}{5}$	$x - y$
10	Solve $\sqrt{2x+1} = 3$	$x = 4$
11	Solve $x(x+5) = x^2 - 4$	$x = -\frac{4}{5}$
12	The histogram for a set of scores is shown at right. Draw on it the <i>ogive</i> .	

The next 2 questions refer to the diagram below.

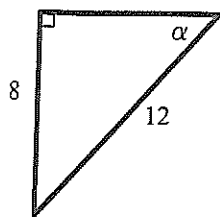
Do not use trigonometry to do this question



13	Find the <u>exact</u> value of x	$\sqrt{80}$ or $4\sqrt{5}$
14	Find the exact value of y	9. LOST AS SUBSEQUENT ERROR

15	4 cards of the same shape and size are numbered 3, 5, 6 and 7. The cards are shuffled and laid out from left to right in random order to form a 4-digit number. What is the probability that the number formed is greater than 7 000?	$\frac{1}{4}$																																													
16	For the following set of scores, give the median <table><tr><th>Score (x)</th><th>Frequency (f)</th><th>Cumulative frequency (cf)</th></tr><tr><td>12</td><td>2</td><td>2</td></tr><tr><td>13</td><td>5</td><td>7</td></tr><tr><td>14</td><td>9</td><td>16</td></tr><tr><td>15</td><td>9</td><td>25</td></tr><tr><td>16</td><td>3</td><td>28</td></tr><tr><td>17</td><td>1</td><td>29</td></tr></table>	Score (x)	Frequency (f)	Cumulative frequency (cf)	12	2	2	13	5	7	14	9	16	15	9	25	16	3	28	17	1	29	14																								
Score (x)	Frequency (f)	Cumulative frequency (cf)																																													
12	2	2																																													
13	5	7																																													
14	9	16																																													
15	9	25																																													
16	3	28																																													
17	1	29																																													
17	In the question above, how many scores were there under 16?	25																																													
18	Fully factorise $x^2 - 5x - 6$	$(x - 6)(x + 1)$																																													
19	Solve for x : $3 - 7x \geq 17$	$x \leq -2$																																													
20	This stem and leaf plot gives the test scores for Mr. Matt Ematics' class: <table><tr><td>2</td><td> </td><td>1</td><td>2</td><td>5</td><td></td><td></td><td></td><td></td></tr><tr><td>3</td><td> </td><td>0</td><td>5</td><td>6</td><td>8</td><td>9</td><td></td><td></td></tr><tr><td>4</td><td> </td><td>2</td><td>3</td><td>5</td><td>6</td><td>7</td><td>8</td><td></td></tr><tr><td>5</td><td> </td><td>0</td><td>1</td><td>3</td><td>8</td><td></td><td></td><td></td></tr><tr><td>6</td><td> </td><td>2</td><td>5</td><td>8</td><td></td><td></td><td></td><td></td></tr></table> What is the median test score?	2		1	2	5					3		0	5	6	8	9			4		2	3	5	6	7	8		5		0	1	3	8				6		2	5	8					45
2		1	2	5																																											
3		0	5	6	8	9																																									
4		2	3	5	6	7	8																																								
5		0	1	3	8																																										
6		2	5	8																																											

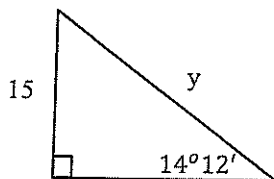
21

Find the value of α to the nearest degree.DIAGRAM NOT
TO SCALE

$$42^\circ$$

41° 49'
accept but not 41°.

22

Find the value of y to 1 decimal place:DIAGRAM NOT
TO SCALE

$$\frac{15}{y} = \sin 14^\circ 12'$$

$$y = \frac{15}{\sin 14^\circ 12'}$$

$$61.1$$

accept 61.2
or 61

23

Simplify $\frac{2x-1}{5} + \frac{1-2x}{4}$

$$\frac{8x-4+5-10x}{20}$$

$$\frac{1-2x}{20} \text{ or } \frac{-2x+1}{20}$$

(Do not accept w/o denominator)

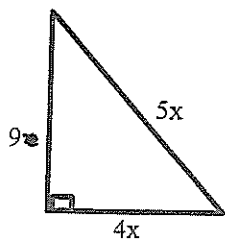
24

For the set of scores below, what is the mean?

Score (x)	frequency (f)	fx
25	2	50
26	5	130
27	10	270
28	8	224
29	1	29
30	2	60
31	2	62
$\Sigma f = 30$		$\Sigma fx =$

$$\frac{825}{30} = 27.5$$

25

Find the exact value of x in the diagram below:

$$25x^2 - 16x^2 = 81$$

$$9x^2 = 81$$

$$x = \pm 3$$

$$x = 3$$

26	Simplify $\frac{3x+3y}{xy+y^2}$	$\frac{3(x+y)}{y(x+y)}$	$\frac{3}{y}$
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The following 2 questions refer to the diagram below

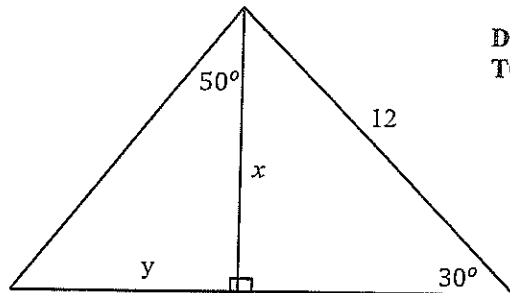


DIAGRAM NOT TO SCALE

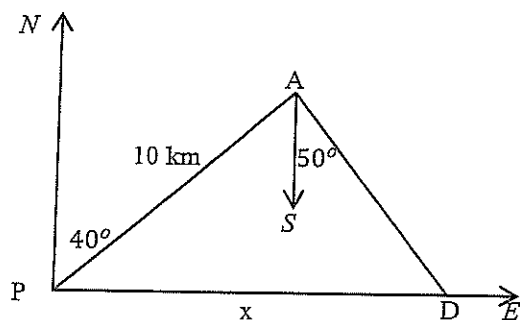
27	Find the value of x $\frac{x}{12} = \sin 30^\circ$	6
28	Find the value of y to 1 dec. place $\frac{y}{x} = \tan 50^\circ$ $y = 6 \tan 50^\circ$	7.2 Accept 7.1 LOOK AT SUBSEQUENT ERROR

29	Simplify $\frac{x^2-9}{3} \div \frac{x+3}{6}$ $\frac{(x-3)(x+3)}{3} \times \frac{6}{x+3}$	$2(x-3)$ or, $2x-6$
30	Solve the following inequality $\frac{5x}{2} - 4 > 4x - 7$ $5x - 8 > 8x - 14$ $6 > 3x$	$x < 2$
31	Plot the solution to question above on the number line provided.	 (SUBSEQUENT ERROR)

32	Simplify $\frac{1}{a} - \frac{1}{a^2}$	$\frac{a-1}{a^2}$
33	Solve for x: $\frac{1}{x+1} = \frac{x+1}{x^2+5}$ $x^2 + 2x + 1 = x^2 + 5$	$x = 2$
34	Simplify $\frac{2x+4}{x-y} \times \frac{x^2-y^2}{2x+2y}$ $\frac{2(x+2)}{(x-y)} \times \frac{(x-y)(x+y)}{2(x+y)}$	$x + 2$

The next 3 questions refer to the information and diagram below:

The diagram below represents the course sailed by a ship, leaving a port P, and sailing on a course of $N40^\circ E$ for 10km. It then resets its course to $S50^\circ E$ until it is at D which is due East of the port P.



35	Find $\angle PAD$	90°
36	Find $\angle APD$	50°
37	How far is the ship (D) away from the port (P) at this time? (Give your answer to the nearest 0.1 kilometre). $\frac{x}{10} = \cos 50^\circ$	15.6 accept 15.5 accept

15.5572 etc...

38	<p>Solve the following for x:</p> $\frac{3x+2}{4} - \frac{x}{3} = \frac{x+1}{2}$ $9x+6 = 4x = 6x+6$ $0 = x$	0
39	<p>Completely factorise</p> $x^2 - 2xy + y^2 + x - y$ $(x-y)^2 + (x-y)$ $= (x-y)[(x-y)+1]$	$(x-y)(x-y+1)$
40	<p>Simplify</p> $\frac{\frac{x+y}{1+\frac{1}{x}}}{\frac{1}{x}+\frac{1}{y}}$ $\frac{xy(x+y)}{x+y}$	$xy.$