

N4 RELATIONSHIPS 1.4

This resource is to support pupils in passing the appropriate National 4 Assessment Standard. The questions and marking schemes used are from SQA past papers and as such test the topics in their entirety from grade A to C and *may* include other areas from the course. In addition the questions from **Paper 1** (P1) should be completed **without** the use of a calculator and questions from **Paper 2** (P2) permit the use of a calculator.

Each Assessment Standard is used to ensure pupils have the minimum competency on the specified sub-skills for the National 4 course. As such each Assessment Standard will test grade C work on that specific topic.

This resource is divided into two sections:

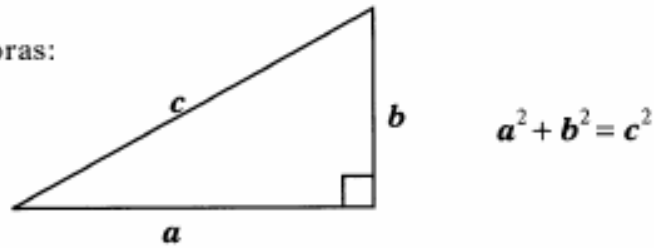
- Section A has an example on each sub skill for the relevant Assessment Standard and the marking scheme for these questions
- Section B has extra practice questions on this Assessment Standard and the marking scheme for these questions

<u>Unit Assessment Standard</u>	<u>Sub skills</u>	Section A – Question Number
Relationships 1.4 Applying statistical skills to representing data	The sub-skills are: constructing a scatter graph drawing and applying a best-fitting straight line	Q1 Q2

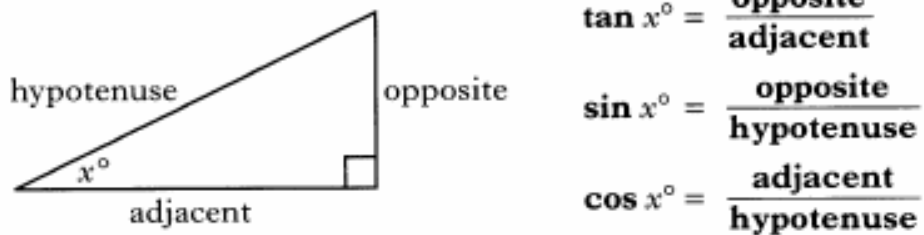
FORMULAE LIST

- Circumference of a circle: $C = \pi d$
 Area of a circle: $A = \pi r^2$
 Curved surface area of a cylinder: $A = 2\pi r h$
 Volume of a cylinder: $V = \pi r^2 h$
 Volume of a triangular prism: $V = Ah$

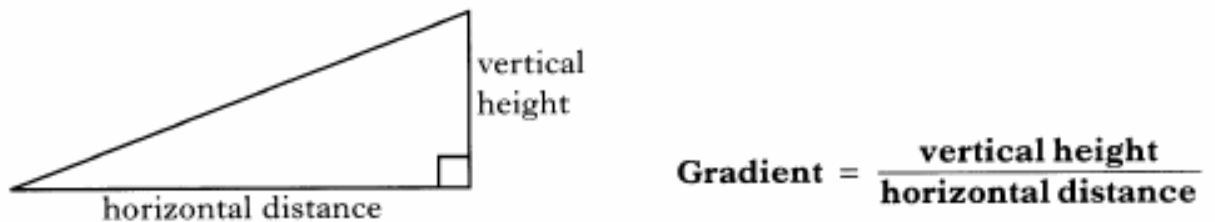
Theorem of Pythagoras:



Trigonometric ratios
 in a right angled
 triangle:



Gradient:



Section A

Q		Marks																											
<p>Q1 P1</p>	<p>7. The table below shows the marks scored by pupils in French and Italian exams.</p> <table border="1" style="margin: 10px auto;"> <thead> <tr> <th style="text-align: center;">Pupil</th> <th style="text-align: center;">A</th> <th style="text-align: center;">B</th> <th style="text-align: center;">C</th> <th style="text-align: center;">D</th> <th style="text-align: center;">E</th> <th style="text-align: center;">F</th> <th style="text-align: center;">G</th> <th style="text-align: center;">H</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">French Mark</td> <td style="text-align: center;">15</td> <td style="text-align: center;">23</td> <td style="text-align: center;">50</td> <td style="text-align: center;">38</td> <td style="text-align: center;">40</td> <td style="text-align: center;">42</td> <td style="text-align: center;">70</td> <td style="text-align: center;">82</td> </tr> <tr> <td style="text-align: center;">Italian Mark</td> <td style="text-align: center;">28</td> <td style="text-align: center;">31</td> <td style="text-align: center;">62</td> <td style="text-align: center;">54</td> <td style="text-align: center;">45</td> <td style="text-align: center;">55</td> <td style="text-align: center;">85</td> <td style="text-align: center;">95</td> </tr> </tbody> </table> <p>(a) Using these marks, draw a scattergraph.</p> <div style="text-align: center; margin-top: 20px;"> </div>	Pupil	A	B	C	D	E	F	G	H	French Mark	15	23	50	38	40	42	70	82	Italian Mark	28	31	62	54	45	55	85	95	<p>2</p>
Pupil	A	B	C	D	E	F	G	H																					
French Mark	15	23	50	38	40	42	70	82																					
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<p>Q2 P1</p>	<p>Using your Scatter Graph from Q1 ...</p>	
	<p>(b) Draw a best-fitting line on the graph.</p> <p>7. (continued)</p> <p>(c) A pupil who scored 65 in his French exam was absent from the Italian exam.</p> <p>Use your best-fitting line to estimate this pupil's Italian mark.</p>	<p>1</p> <p>1</p>

Section A

MARKING

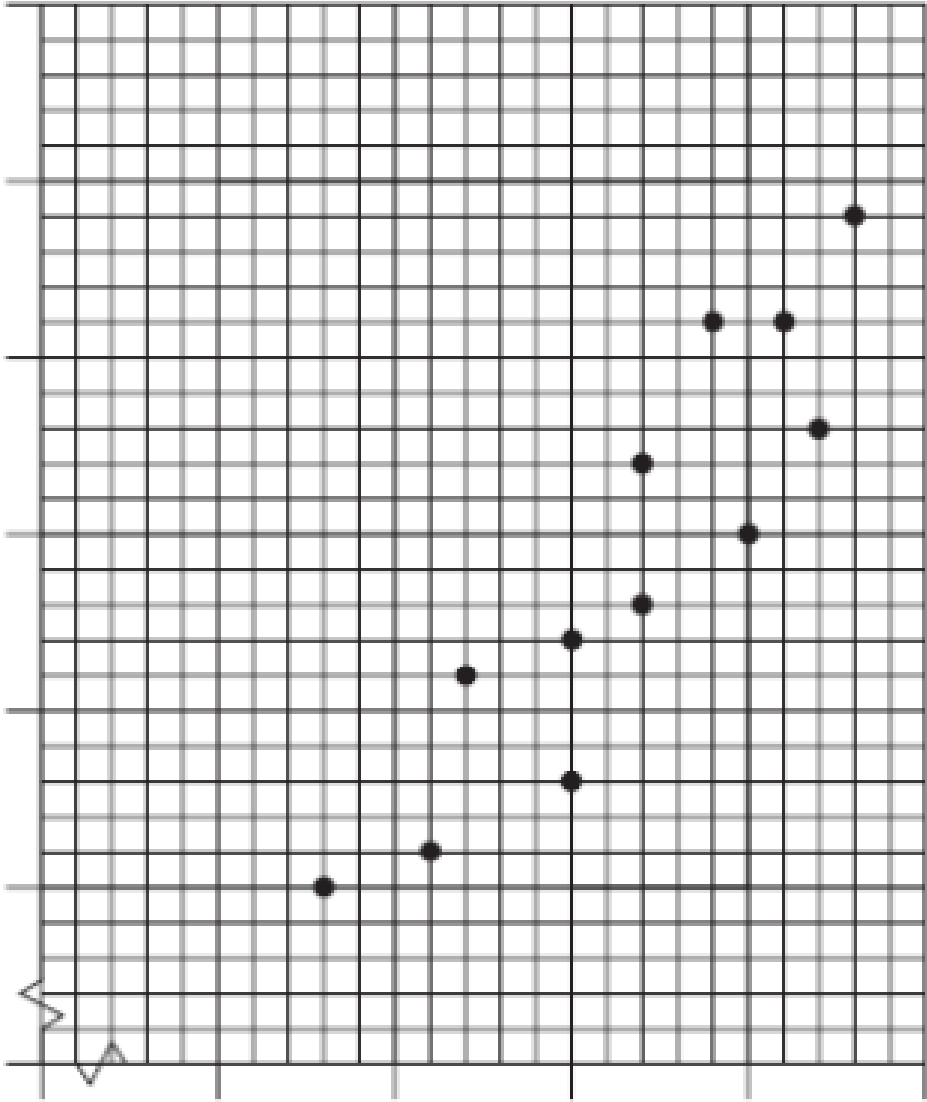
SCHEME

Section A - Marking Scheme

Q			Marks				
Q1	7 (a)	<table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding-right: 10px; vertical-align: top;"> <p>Ans: All 8 points plotted correctly</p> <p>•¹ 3 points correct</p> <p>•² A further 5 points correct</p> </td> <td style="padding-left: 10px; vertical-align: top;"> <p>•¹</p> <p>•²</p> </td> </tr> </table>	<p>Ans: All 8 points plotted correctly</p> <p>•¹ 3 points correct</p> <p>•² A further 5 points correct</p>	<p>•¹</p> <p>•²</p>	2		
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Q2	7.	<table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding-right: 10px; vertical-align: top;"> <p>(b) Ans: Best-fitting line drawn</p> <p>•¹ A best-fitting line drawn</p> </td> <td style="padding-left: 10px; vertical-align: top;"> <p>•¹</p> </td> </tr> <tr> <td style="border-right: 1px solid black; padding-right: 10px; vertical-align: top;"> <p>(c) Ans: Answer read from line (± 2)</p> <p>•¹ Answer read from line</p> </td> <td style="padding-left: 10px; vertical-align: top;"> <p>•¹ Answer read from line (± 2)</p> </td> </tr> </table>	<p>(b) Ans: Best-fitting line drawn</p> <p>•¹ A best-fitting line drawn</p>	<p>•¹</p>	<p>(c) Ans: Answer read from line (± 2)</p> <p>•¹ Answer read from line</p>	<p>•¹ Answer read from line (± 2)</p>	1 1
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<p>(c) Ans: Answer read from line (± 2)</p> <p>•¹ Answer read from line</p>	<p>•¹ Answer read from line (± 2)</p>						

Section B

Section B – Paper 1 – Questions

Q		Marks
1	<p>2. The scattergraph shows the weights and heights of a group of teenagers.</p> <div style="text-align: center;">  <p>The scattergraph plots Height (cm) on the vertical axis against Weight (kg) on the horizontal axis. The vertical axis has major grid lines every 10 units from 140 to 190, with a break between 140 and 130. The horizontal axis has major grid lines every 10 units from 60 to 80. There are 15 data points plotted, showing a clear positive linear trend. The points are approximately at the following coordinates: (63, 140), (66, 142), (66, 152), (70, 146), (70, 154), (72, 156), (72, 164), (74, 172), (75, 160), (76, 172), (77, 166), and (78, 178).</p> </div> <p>(a) Draw a line of best fit through the points on the graph.</p> <p>(b) Use your line of best fit to estimate the height of a teenager whose weight is 80 kilograms.</p>	2

Section B – Paper 2 – No Questions

Section B

MARKING

SCHEME

Section B – Paper 1 – Marking Scheme

Q					Marks	
1	2	a	<p>Ans: line of best fit drawn</p> <ul style="list-style-type: none"> •¹ draw line of best fit 	1	<p>1. Accept straight lines with $1 \leq \text{gradient} \leq 2$ and $(\text{points above line}) - (\text{points below line}) \leq 2$</p>	1
	2	b	<p>Ans: consistent with line of best fit</p> <ul style="list-style-type: none"> •¹ consistent with line of best fit 	1	<p>1. You may have to extend candidate's line to check answer</p>	

Section B – Paper 2 – No Marking Scheme