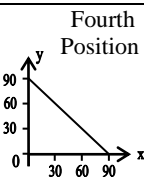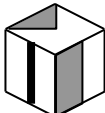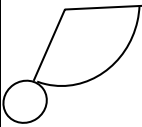# YEAR 9 – PAPER SIX
ANSWERS AND LEARNING STATEMENT

NON CALCULATOR

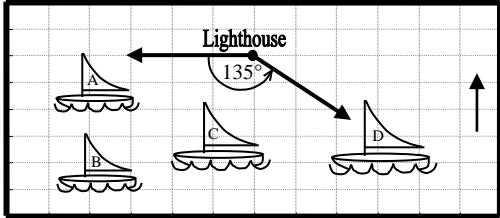| QUESTION	ANSWER	WORKED SOLUTION	LEARNING STATEMENT A student can	NSW SYLLABUS
1	100	8 pizza symbols represent 160 pizzas, so 1 pizza symbol represents $160 \div 8 = 20$ pizzas. Therefore, 5 pizza symbols represent $5 \times 20 = 100$ pizzas sold in the second week.	Display and interpret data in graphs with scales of many to one correspondence.	DS 3.1
2	21	Total number of movies watched by the group is $14 + 16 + 22 + 25 + 28 = 105$ Mean is $\quad 105 \div 5 = 21$	Interpret data displayed in a stem and leaf plot. Analyse data.	DS 4.1 DS 4.2
3	100°	$\theta = 180° - (40° + 40°) = 100°$ (angle sum of triangle)	Apply knowledge of angle properties of triangles to find a missing angle.	SGS 4.3
4	37	Each subsequent shape has an additional 9 matchsticks. Therefore, she needs $28 + 9 = 37$ matchsticks for the fourth shape.	Identify and continue a number pattern to determine the next value.	PAS 4.2
5		Plotting the points in the table would give the straight line graph in the fourth position.	Identify the graph of a simple function from a table of values	PAS 4.5
6	C2	Only row 2 is in front of Tania and behind Jane, hence the only possible alternative is C2.	Use alpha-numeric coordinates to specify a location in a practical context.	SGS 2.3
7	36 cm	3 cm represents 24 cm (by measurement) so 1 cm represents 8 cm $\therefore$ 4.5 cm represents 36 cm	Calculate dimensions in similar figures.	SGS 4.4
8	2cm represents 3mm	4 cm represents 6mm (given ratio) so 2 cm represents 3mm	Identify the scale used in a scale drawing.	SGS 4.4
9	1 in 5	The chance of getting a white car is 8 out of 40, which simplifies to 1 out of 5.	Determine the probability of a simple event.	NS 3.5
10	quarter of the area of triangle ADE	Let $AB = h$ and $AC = b$ so the area of triangle ABC $= \frac{1}{2}bh$ $AD = 2h$ and $AE = 2b$ so the area of triangle ADE $= \frac{1}{2} \times 2b \times 2h = 2bh$, which is 4 times the area of Δ ABC.	Determine the relative areas of two similar shapes.	MS 3.2
11	12	$2x - 8 = x + 4$ (equal sides isosceles ΔABC) Hence, $x = 12$	Establish and solve a linear equation in a practical context.	PAS 4.4

12	1625 ml	The amount of milk in the bottle when it was full is 175 + 200 + 1250 = 1625ml	Measure and add volumes using suitable metric units.	MS 2.3 Unit 2
13	Christine	Jessica defeated Hannah, Dimitra defeated Jessica, Louise defeated Dimitra and Christine was the only undefeated competitor. Hence, Christine was the winner.	Interpret a description of a set of relationships and then arrange them in order.	NS 3.1
14	20p + 35	By expanding the expression $5(4p + 7) = 20p + 35$	Expand an algebraic expression to identify an equivalent form.	PAS 4.3
15	20%	The discount was $200 – $160 = $40 Hence, the percentage discount was $\frac{40}{200} \times 100\% = 20\%$	Express one quantity as a percentage of another.	NS 4.3
16	126 m²	The area of the bird enclosure is 54m² and this area is represented by 6 square units. Hence, 1 square unit represents 9m². Hence, the Dolphin pool is $14 \times 9 = 126$m²	Measure areas using informal units.	MS 2.2
17	116°	Read scale from 0° on the left, move clockwise through 90° to 116°	Read a protractor scale to accurately measure a given obtuse angle.	SGS3.2b
18	4th cube	First cube cannot be correct as the dot should be on the opposite face to triangle. There should be a square on the face where the line is on the second and third cubes. The fourth cube is correct.	Identify the net of a prism with different faces.	SGS 3.1
19	1.4	Create a division by whole numbers $0.84 \div 0.6 = 8.4 \div 6 \qquad 6\overline{)8.4}^{\,1.4}$	Add, subtract, multiply and divide decimals (limit operators to 2 digits for division).	NS 4.3
20	36%	The number of students who chose tennis was 25 – 4 – 5 – 7 = 16. Therefore, the percentage of students who chose tennis was $\frac{9}{25} \times 100 = 36\%$	Express one quantity as a percentage of another.	NS 4.3
21	90km	David travels at 60 km per hour for 2.5 hours so he must cover $60 \times 2.5 = 150$ km Hence, the distance he travelled in the last hour was 240 – 150 = 90km.	Solve a variety of real life problems involving rates.	NS 4.3
22	$p = 4$	$8p - 8 = 3p + 12$ $5p - 8 = 12$ $5p = 20$ $p = 4$	Solve a linear equation with one variable.	PAS 4.4

23	16	If Anthony gave Peter n vouchers, he still had $4n$ vouchers. Therefore, $n + 4n = 80$ ie. $5n = 80$ so $n = 16$	Create and solve a linear equation with one variable.	PAS 4.4
24	0.2	Advertisements occur for 10 minutes every $40 + 10 = 50$ minutes. Hence, the probability of an advertisement is $\frac{10}{50} = 0.2$	Solve probability problems involving simple events.	NS 4.4
25	(–2, 5)	The pattern of values shows that the sum of the x and y values is 3. Hence, the point (–2, 5) satisfies this condition.	Formulate an expression to model a relationship and use it to identify a point which satisfies the expression.	PAS 4.2 PAS 4.5
26	5^3, 2^7, 4^4	$4^4 = 256$, $5^3 = 125$, $2^7 = 128$ so the correct sequence is 5^3, 2^7, 4^4	Evaluate and compare 1-digit, positive integers raised to simple powers.	NS 5.1.1
27	19	$(-3)^2 = 9$ so $1 + 2a^2 = 1 + 2 \times 9 = 19$	Evaluate an algebraic expression involving multiple operations with a negative variable.	PAS 4.3
28	18%	30% = 0.3, 60% = 0.6 and as we want to find 30% of 60% then the answer is $0.3 \times 0.6 = 0.18$ which is 18%	Solve a multi step percentage problem.	NS 5.2.2
29	54°	Each angle at the centre is $360° \div 5 = 72°$ (angle of revolution at the centre). As the triangle is isosceles then its base angles are equal. Therefore, $2x + 72° = 180°$ (angle sum of a triangle). Hence, x = 54°.	Apply knowledge of polygons and their angle properties to solve problems.	SGS5.2.1
30	P = 11, C = 4	When C = 4, 3C – 4 = 8 and 11 > 8 So P = 11, C = 4 is a solution. All other options are invalid.	Identify the pair of variables that satisfy a given inequality.	PAS 4.4
31	150	The number of chocolate cakes sold over the whole week was $90 \times 7 = 630$ cakes. The number of chocolate cakes sold over six days was $80 \times 6 = 480$ cakes. Therefore, the number of cakes sold on Sunday was $630 – 480 = 150$ cakes.	Calculate the effect of change on a set of data.	DS 4.2
32	35 – x	Let Jessica's age be J so J = 40 – x ∴ V = J – 5 V = 40 – x – 5 V = 35 – x	Create and solve a linear equation with one variable.	PAS 4.4

YEAR 9 – PAPER SIX – CALCULATOR ALLOWED

QUESTION	ANSWER	WORKED SOLUTION	LEARNING STATEMENT A student can	NSW SYLLABUS
1	Thriller and Comedy	It can be seen on the sector graph that the adjacent sectors for Thriller and Comedy together subtend an angle greater than 180° at the centre of the circle.	Draw and interpret sector graphs.	DS 4.1
2	$13.70	The value of the share 2 weeks ago was $12.80 – $3.75 = $9.05 .Its value last week was $9.05 + $4.65 = $13.70.	Solve a problem involving addition and subtraction of decimals.	NS 2.4
3	40	8a is twice 4a, so if 4a = 20 then 8a = 40	Evaluate a simple algebraic expression.	PAS 4.4
4	172cm	Mean = (158+178+162+192+170) ÷5 = 172 cm	Calculate the mean from a set of data.	DS 3.1
5	$13\frac{1}{6}$	Calculate how much each term is increasing by $6\frac{1}{6}-3\frac{5}{6}= 2\frac{1}{3}$, $10\frac{5}{6}-8\frac{1}{2}=2\frac{1}{3}$ ∴ the next term is $10\frac{5}{6}+2\frac{1}{3}=13\frac{1}{6}$	Solve a problem involving common fractions.	NS 4.3
6	The 2nd net	The second net is the only one that can be folded to form a cone.	Identify the net of a solid shape.	SGS 3.1
7	49	If p + 1 = 8 then p = 7 ∴ p² = 49	Evaluate an algebraic expression involving multiple operations.	PAS 4.3
8	60m	If 5cm represents 100m then 1cm represents 20m. Hence,3 cm represent 60m.	Determine and use scale to calculate the side length of an enlarged shape.	SGS 4.4
9	The third shape	The first shape has rotational symmetry. The second shape has no symmetry. The fourth shape has a larger arc on the upper side than on the lower side. Only the third shape has a line of Symmetry.	Recognise a line of symmetry drawn on an irregular 2D shape.	SGS2.2a
10	4200 litres	There are 5 lots of 3 days in 15 days so the family will use 840 × 5 = 4200 litres.	Compare and record volumes and capacities using litres, millilitres and cubic centimetres.	MS 2.3
11	2	Substituting p = 8 gives $\frac{5\times 8}{2\times 8+4}=\frac{40}{20}=2$	Evaluate an algebraic expression involving multiple operations.	PAS 4.3

12	20%	There are 8 + 32 = 40 members in the club. Hence, the percentage of black belt members is $\frac{8}{40} \times 100 = 20\%$	Express a quantity as a percentage.	NS 4.3
13	B(2, 0) C(0, 6)	At B the x value is 5 − 3 = 2 and y = 0 At C the x value is 0 and y = 4 + 2 = 6 Hence, B(2, 0) and C(0, 6)	Plot and name ordered pairs on the number plane.	PAS 4.5
14	y = x² + 3	All of the ordered pairs satisfy only the equation y = x² + 3. Eg. when x = 0, y = 3, when x = 1, y = 4	Determine whether a point lies on a line by substituting into the equation of the line.	PAS5.1.2
15	85°	∠ABE = 180° − 130° = 50° (angle of straight line ABC) ∠AEB = 180° − 135° = 45° (angle of straight line AEF) Hence, ∠BAE = 180°−(50° + 45°) = 85° (angle sum of triangle ABE)	Apply knowledge of angle properties of straight lines and triangles to solve problems.	SGS 4.2
16	5 times the side length of the original	As the enlarged photo is a square with area 400cm² then each side must be $\sqrt{400}$ = 20cm. As the original photo has sides of 4cm, the enlargement's sides are 20 ÷ 4 = 5 times as long.	Apply knowledge of squares and similar figures to determine the scale factor for a pair of similar figures.	SGS 4.4
17	122cm	C = π×d so C = π × 38.8 = 121.89… Hence, the circumference is 122cm (to the nearest cm).	Calculate the circumference of a circle.	MS 4.1
18	285 m²	The area of the lion enclosure is 195m² and this area is represented by 13 square units. Hence, 1 square unit represents 15m². Hence, the tiger enclosure is 19 × 15 = 285 m².	Calculate the area of a shape drawn on a square grid.	MS 3.2
19	Third triangle 92°, 44°, 44°	The missing angle of the third triangle is 180° − (92° + 44°) = 44° (angle sum of a triangle). Therefore, this triangle has an obtuse angle and the two other angles are equal. Hence, it is an obtuse angled, isosceles triangle.	Identify a 2D shape according to its side and angle properties.	SGS 4.3
20	4 hours and 35 minutes	From 10:40 am until 11am there are 20 minutes. From 11am until 3pm there are 4 hours. From 3pm until 3:15 pm there are 15 minutes. The total time was 4 hours and 35 minutes.	Calculate elapsed time in hours and minutes between two given digital times in am/pm notation.	MS 3.5

21	−19	Substitute $q = 4.6$ into the equation. $p = 4 − 5 × 4.6$ so $p = −19$	Substitute a decimal into a linear function to determine a missing value.	PAS 4.3
22	$0.45	Each can at the supermarket is worth $18 ÷ 24 = 75$ cents $= 0.75 Trevor would save $1.20 − $0.75 = 0.45 per can	Solve a practical problem involving multiple operations with money.	NS 4.3
23	150°	$\angle PNQ = 60°$ (angle in an equilateral triangle) $\angle QNS = 90°$ (angle in a square) $\angle SNM = 60°$ (angle in an equilateral triangle) So reflex $\angle MNP = 60° + 90° + 60° = 210°$ Hence, obtuse $\angle MNP = 360° − 210° = 150°$	Apply knowledge of the angle sum of polygons to find the size of an angle.	SGS 4.2
24	60	Substitute $h = 288$ into the formula $d = \dfrac{5}{2}\sqrt{2 × 288}$ ∴ $d = 60$km	Substitute into formulae used in other strands of the syllabus or in other key learning areas.	PAS 4.4
25	24	The 4th term is $5700 ÷ 6 − 2 = 948$ The 5th term is $948 ÷ 6 − 2 = 156$ The 6th term is $156 ÷ 6 − 2 = 24$	Use a rule to find subsequent terms in a number pattern.	PAS 4.2
26	Boat D	Face west and turn 135° anticlockwise as shown 	Use compass points and angle of turn to determine direction.	SGS 3.3
27	125cm	Using the ratio of similar triangles ABE and ACD we get $\dfrac{25}{CD} = \dfrac{40}{40+160}$ then $40 × CD = 25 × 200$ Hence, CD = 125cm	Apply knowledge of similar triangles to determine a missing length.	SGS 4.4
28	10n + 2	Only the second rule satisfies both pairs of values, as shown below. When $n = 2$, $10 × 2 + 2 = \mathbf{22}$ When $n = 5$, $10 × 5 + 2 = \mathbf{52}$	Identify the linear function that models a practical situation given two pairs of values.	PAS 4.2
29	$6x^2 − 48$	The area of the entire rectangle is $3x × 2x = 6x^2$ The area of the garden is $4 × 12 = 48$m² Hence, the area of the restaurant is the difference of these two areas $A = (6x^2 − 48)$m²	Identify the non-linear expression that models the relationship in a practical situation.	PAS 4.3

30	85	Substitute $2640 for C in the formula and find the corresponding value of n $2640 = 24n + 600$ $24n = 2040$ $n = 85$ Hence, Monique can have 85 guests at her party.	Interpret and solves a two-step linear equation in a practical context.	PAS 4.4
31	$ 48.50	Each wall is 4m × 3.2m = 12.8m² so total area of walls is 4×12.8m² = 51.2m² Area of the ceiling is 4 × 4 = 16m² Total area is 51.2 + 16 = 67.2m² 67.2 ÷ 15 = 4.48 litres David must buy 5 litres; that is two 2 litre cans and one 1 litre can, so the total cost is 2 × $18.50 + $11.50 = $ 48.50	Use surface area to solve a practical problem.	MS 4.2

32	6.2m	The sum of the heights of the three giraffes is 5.3 × 3 = 15.9m
		Let the height of the tallest giraffe be h metres. Then, the height of the middle giraffe will be (h – 1.1) metres
		So h + h – 1.1 + 4.6 = 15.9
		2h + 3.5 = 15.9
		      2h = 12.4
		       h = 6.2
		Hence, the tallest giraffe is 6.2 m high.
			Formulate and solve an expression to model a practical situation.	PAS 4.4