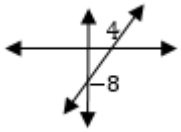
basic education
Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

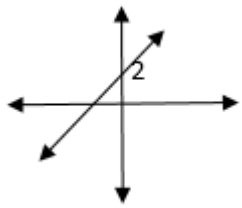
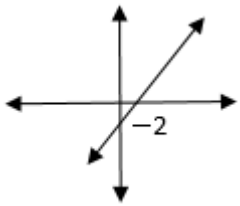
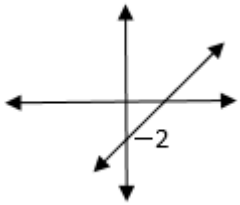
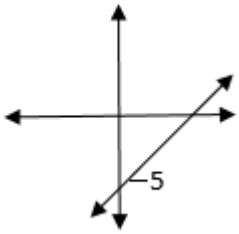
MARKING GUIDELINE 2021
MATHEMATICS: ENGLISH
GRADE 9

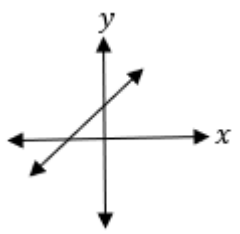
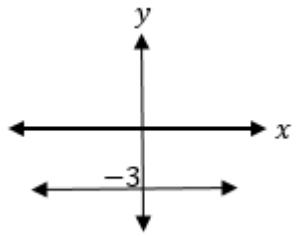
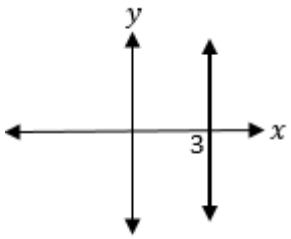
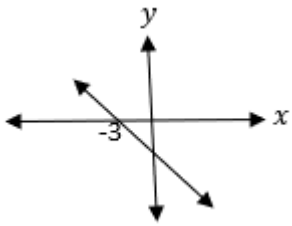
SECTION A

- *One mark per answer.*
- *There are no half marks.*
- *Tick* (✓) only the correct answer and underline the incorrect one.

No.		Expected answer	KEY (✓)	Rational
1.	A	3		Input 15 is divided by 3 and 2 is subtracted which is equal to 3.
	B	7		Input 15 is divided by 3 and 2 added which is equal to 7.
	C	43	✓	Correct answer
	D	47		Input 15 is multiplied by 3 and 2 added which is equal to 47.
2.	A	7		Output 4 add 1 and add 2 is equal to 7.
	B	10		Output 4 add 1 and multiplied by 2 is equal to 10.
	C	$\frac{5}{2}$	✓	Correct answer
	D	$\frac{3}{2}$		Output 4 subtract 1 and divided by 2 is equal to $\frac{3}{2}$.
3.	A	$y = 2x - 3; x = 9$		Only used the first input and output values.
	B	$y = 2x + 3; x = 6$		Only used the first input and output values, but with the wrong sign.
	C	$y = \frac{1}{2}x + 3; x = 24$	✓	$y = \frac{1}{2}x + 3$ $15 = \frac{1}{2}x + 3$ $12 = \frac{1}{2}x$ $24 = x$
	D	$y = \frac{1}{2}x - 3; x = 36$		Used the wrong sign for the 3.

No.		Expected answer	KEY (✓)	Rational
4.	A	$1\,766{,}25$		$V = 3.14(15)^2\ (250)$ $V = 1\,766{,}25$ Put back the 2 decimal places
	B	11775		$V = 3{,}14(15)\ (250)$ $V = 11775$ Did not square the radius.
	C	$176\ 625$	✓	$V = 3.14(15)^2\ (250)$ $V = 176\ 625$
	D	$17\ 662\ 500$		$V = 3.14(15)^2\ (250)$ $V = 17\ 662\ 500$ Did not use the 2 decimal places.
5.	A	$y = 3x - 5$		Only looked at the first 2 input and output values.
	B	$y = -3x - 1$		Used the wrong sign $-4\ -1 = -3$
	C	$y = 3x^2 - 7$		Wrong coefficient for x^2.
	D	$y = x^2 - 5$	✓	$y = x^2 - 5$ $y = (-1)^2 - 5 = -4$ $y = (2)^2 - 5 = -1$ $y = (3)^2 - 5 = 4$
6.	A	$y = 2x + 8$		Wrong sign for the 8 once simplified.
	B	-2 | -1 | 0 | 1 -12 | -10 | -6 | -4		Only substituted the first 2 values.
	C	Input $x \times\ 2\ -4$ = output y.		Simplified Incorrectly.
	D		✓	$y = 2x - 8$ On Y-axis $x = 0$: $y = -8$ On X-axis $y = 0$: $2x = 8 \implies x = 4$
7.	A	$4x + 6y - 10 = 0$		A$(-2;3) : 4(-2) + 6(3) - 10 = 0$ Only substituted the first pair.
	B	$3x - 2y - 24 = 0$		A$(-2;3) : 4(-2) + 6(3) - 10 = 0$ B$(4;-6) : 3(4) - 2(-6) - 24 = 0$ Only substituted the first 2 pairs.
	C	$-6x - 4y = 0$	✓	$-6x - 4y = 0$ A$(-2;3) : -6(-2) - 4(3) = 0$ B$(4;-6) : -6(4) - 4(-6) = 0$ C$\left(-1;\frac{3}{2}\right) : -6(-1) - 4(\frac{3}{2}) = 0$
	D	$2y + 3x + 2 = 0$		$y = -\frac{3}{2}x$ only saw the same values.

No.		Expected answer	KEY (✓)	Rational
8.	A	 Gradient= $\frac{3}{4}$		Y-intercept incorrect.
	B	 Gradient= $\frac{3}{4}$	✓	$3x - 3 - 4y - 5 = 0$ $3x - 8 = 4y$ $\frac{3}{4}x - 2 = y$
	C	 Gradient= $\frac{4}{3}$		Gradient incorrect.
	D	 Gradient= $\frac{3}{4}$		Both gradient and y −intercept incorrect.
9.	A	Gradient is undefined.		Lacks knowledge of undefined gradient
	B	Gradient is zero.		Lacks knowledge of zero gradient
	C	Gradient is negative.	✓	Correct answer.
	D	Gradient is positive.		Ignored the shape of the gradient.

No.		Expected answer	KEY (✓)	Rational
10.	A			Positive gradient
	B			Zero gradient
	C		✓	Correct answer
	D			Negative gradient
11.	A	Their gradients are equal.	✓	Correct answer.
	B	The product of the gradients is -1.		Lacks knowledge that gradients of parallel lines are equal
	C	The product of the gradients is 1.		Lacks knowledge that gradients of parallel lines are equal
	D	The sum of the gradient is 0.		Lacks knowledge that gradients of parallel lines are equal
12.	A	The gradients are equal.		Lacks knowledge that gradients of perpendicular line is -1.
	B	The product of the gradients is 1.		Lacks knowledge that gradients of perpendicular line is -1.
	C	The sum of the gradient is 0.		Lacks knowledge that gradients of perpendicular line is -1.
	D	The product of the gradients is -1.	✓	Correct answer.

No.		Expected answer	KEY (✓)	Rational
13.	A	$-\frac{3}{8}$		Used incorrect formula: $\frac{Change\ in\ x}{Change\ in\ y} = \frac{-2-1}{4-(-4)} = \frac{-3}{8}$
	B	$-\frac{6}{5}$		Used incorrect formula. Used $\frac{y_2-x_2}{y_1-x_1} = -\frac{6}{5}$
	C	$-\frac{0}{1}$		Used incorrect formula. $\frac{y_2+y_1}{x_2+x_1} = 0$
	D	$-\frac{8}{3}$	✓	$\frac{y_1-y_2}{x_1-x_2} = \frac{4-(-4)}{-2-1} = \frac{8}{-3}$
14.	A	Positive gradient and positive y-intercept	✓	$m = \frac{3}{2}$ and $c = 2$ of which they are both greater than 0.
	B	Positive gradient and negative y-intercept		Gradient is greater than zero but constant value is less than zero.
	C	Negative gradient and positive y-intercept		Gradient is less than zero but constant is greater than zero.
	D	Negative gradient and negative y-intercept		Both gradient and constant value are less than zero.
15.	A	$m = -3; c = -6$	✓	$-2y = 6x - 12$ $y = -3x - 6$
	B	$m = -3; c = 6$		Correct gradient and incorrect y-intercept. $-2y = -6x - 12$ $y = -3x + 6$
	C	$m = -2; c = 4$		Incorrect gradient and incorrect y-intercept $-3y = 6x - 12$ $y = -2x + 4$
	D	$m = 2; c = 4$		Incorrect gradient and incorrect y-intercept $-3y = 6x - 12$ $y = 2x + 4$
16.	A	$(-3\ ;\ -3)$	✓	Correct answer.
	B	$(3\ ;\ -3)$		Swapped the coordinates.
	C	$(-3\ ;\ 3)$		Repeated the same coordinates.
	D	$(3\ ;\ 3)$		Reflected in the Y-axis.

No.		Expected answer	KEY (✓)	Rational
17.	A	Reflection in the X-axis.	✓	Correct answer.
	B	Reflection in the Y-axis.		Reflected in the Y-axis.
	C	Translation to the right.		Translated P horizontally.
	D	Translation downwards.		Translated P vertically.
18.	A	$(-3\ ;\ 5)$		Gave co-ordinates of M'.
	B	$(3\ ;\ 5)$		Reflected in the Y-axis.
	C	$(-3\ ;\ -5)$	✓	Correct answer.
	D	$(3\ ;-5)$		Reflected in both X-axis and Y-axis.
19.	A	$(x\ ;\ y)\ \rightarrow\ (-x\ ;\ y)$		Incorrectly substituted.
	B	$(x\ ;\ y)\ \rightarrow\ (-x\ ;-y)$		Incorrectly substituted.
	C	$(x\ ;\ y)\ \rightarrow\ (x\ ;-y)$	✓	Correct answer.
	D	$(x\ ;\ y)\rightarrow\ (x\ ;\ y)$		Incorrectly substituted.
20.	A	Fig 1		Took the figure as it is.
	B	Fig 2	✓	Correct answer.
	C	Fig 3		Reflected in the Y-axis.
	D	Fig 4		Swapped the coordinates.
21.	A	X'$(-2;3)$, Y'$(1;4)$, Z'$(3;0)$		Reflected in the Y-axis.
	B	X'$(3;2)$, Y'$(4;-1)$, Z'$(0;-3)$		Swapped the coordinates.
	C	X'$(-2;-3)$, Y'$(-1;-4)$, Z'$(-3;0)$		Did not know transformation.
	D	X'$(2;-3)$, Y'$(-1;-4)$, Z'$(-3;0)$	✓	Correct answer.

No.		Expected answer	KEY (✓)	Rational
22.	A	$(3\ ;\ 3)$		Translated 1 unit upwards.
	B	$(3\ ;\ -2)$		Translated 4 units downwards.
	C	$(3\ ;\ 1)$	✓	Correct answer.
	D	$(3\ ;\ -1)$		Translated 3 units downwards.
23.	A	Translating the object three units up and five units down.		Did not know the rules of translation.
	B	Translating the object three units down and five units up.		Did not know the rules of translation.
	C	Translating the object three units to the right and five units down.	✓	Correct answer.
	D	Translating the object three units to the left and five units up.		Did not know the rules of translation.
24.	A	$Q'(-13;7)$		Incorrect manipulation.
	B	$Q'(13;-7)$		Incorrect manipulation.
	C	$Q'(-7;11)$		Incorrect manipulation.
	D	$Q'(-7;7)$	✓	Correct answer.
25.	A	30^0	✓	$\hat{B}_1 + \hat{B}_2 = 90^0$ Comp. ∠, $\therefore \hat{B}_1 = 30^0$.
	B	60^0		$\hat{B}_1 = \hat{B}_2 = 60^0$
	C	45^0		$\frac{90^0}{2} = 45^0$
	D	90^0		The learner incorrectly taught $\hat{B}_1 = \hat{B} = 90^0$
26.	A	Complementary angles.	✓	Correct answer
	B	Supplementary angles.		Lacks understanding of definition of complementary angles.
	C	Vertically opposite angles.		Lacks understanding of definition of complementary angles.
	D	Angles around the point.		Lacks understanding of definition of complementary angles.

No.		Expected answer	KEY (✓)	Rational
27.	A	90^0		$\widehat{D}_1 = 90^0$ ∴ incorrectly concluded that all angles equal to 90^0.
	B	180^0		$\widehat{D}_1 + \widehat{D}_2 = 180^0$ ∴ incorrectly concluded that all angles add up to 180^0
	C	270^0		$\widehat{D}_1 + \widehat{D}_2 + \widehat{D}_3 = 270^0$ ∴ incorrectly concluded that all angles add up to 270^0
	D	360^0	✓	Correct answer
28.	A	Supplementary angles.		Associated 180^0 with supplementary angles.
	B	Complementary angles.		Confused complementary angles with Co-interior angles.
	C	Co- interior angles.	✓	Correct answer
	D	Corresponding angles.		Confused with alternate angles.
29.	A	$\widehat{V}_1$		Learner misunderstood L3 ∥ L4.
	B	$\widehat{T}_1$	✓	$\widehat{T}_1 = \widehat{K}_1$ Corr. $\angle s$, L1∥ L2.
	C	$\widehat{T}_3$		$\widehat{T}_3 = \widehat{K}_1$ misunderstood to be alternate angles.
	D	$\widehat{K}_3$		Misunderstood to be vertically opposite angles.
30.	A	58^0		$\hat{S}_1 = \hat{S}_3 = 58^0$ Vert.opp. $\angle s$ =; $\hat{S}_1 = \hat{T}_3 = 58^0$ and incorrectly concluded that $\hat{T}_1 = \hat{T}_3 = 58^0$
	B	16^0	✓	$\hat{S}_1 = \hat{S}_3 = 58^0$ Vert.opp. $\angle s$ =; $\hat{S}_1 = \hat{T}_3 = 58^0$; $\hat{T}_1 + 90^0 + 58^0 = 180^0$; $2x = 32^0$ ∴ $x = 16^0$
	C	32^0		$\hat{S}_1 = \hat{S}_3 = 58^0$ Vert.opp. $\angle s$ =; $\hat{S}_1 = \hat{T}_3 = 58^0$; $\hat{T}_1 + 90^0 + 58^0 = 180^0$; $2x = 32^0$ ∴ $\hat{T}_1 = 2x = 32^0$
	D	45^0		$\hat{T}_1 + \hat{T}_3 = 90^0$ and $\hat{T}_1 = \hat{T}_3$ since $\hat{T}_2 = 90^0$ hence $\hat{T}_1 = 45^0$
31.	A	110^0		2k+10^0 = k + 110^0 , ignored the left-hand side
	B	120^0		$110^0 + 10^0 = 120^0$
	C	100^0	✓	$2k + 10^0 = k + 110^0$ Vert. opp =, $k = 100^0$
	D	170^0		$k = 180^0 - 10^0 = 170^0$

No.		Expected answer	KEY (✓)	Rational
32.	A	106°	✓	$x + y + 45° = 180°$ …suppl ∠s on a str. Line $x = 135° - y$ $x = 58° + 2y - 10°$ .. vert opp ∠s $135° - y = 58° + 2y - 10°$ $y = 29°$ $x = 135° - 29°$ $x = 106°$
	B	202°		$x + y + 45° = 180°$ …suppl ∠s on a str. Line $x = 135° + y$ (incorrect manipulation) $x = 58° + 2y + 10°$ .. vert opp ∠s $135° + y = 58° + 2y + 10°$ $y = 67°$ $x = 135° + 67°$ $x = 202°$
	C	58^0		$x = 58^0$ incorrectly concluded that are vertically opp..$\angle's$
	D	48^0		Used $58^0 - 10^0 = 48^0$
33.	A	20^0		$y = 20^0$, learner took 20°from $\widehat{B}_1 = 3x - 20^0$
	B	70^0	✓	$3x - 20° + 60° + 50° = 180^0$,$\angle's$ on a straight line, $x = 30°$,$\widehat{B}_1 = 3(30°) - 20^0 = 70°$ $y = \widehat{B}_1 = 70°$,alter.$\angle's$=, AB∥MN
	C	60^0		$y = 60^0$, learner took $60°$from $\widehat{B}_2 = 60^0$
	D	50^0		$y = 50^0$ learner took $50°$ from $\widehat{B}_3 = 50^0$
34.	A	66^0		$\hat{S}_4 = 180^0 - 48^0 = 132^0$ co int.$\angle's$,MN∥RP; $\hat{S}_4 = \hat{S}_2 = 132^0$,vert. opp.$\angle's$ =;$\hat{O}_1 = \hat{P} = 66^0$ $\angle's$ opp. equal (manipulation error) sides of a Δ,∴ $\hat{O}_2 = \hat{P} = 66^0$,alt.$\angle's$ RP∥OQ
	B	48^0		$\hat{O}_1 + \hat{O}_2 = \hat{N} = 48^0$ alt.= $\angle's$, incorrectly concluded that $\hat{O}_2 = 48^0$
	C	24^0	✓	$\hat{S}_4 = 180^0 - 48^0 = 132^0$ co int.$\angle's$,MN∥RP; $\hat{S}_4 = \hat{S}_2 = 132^0$,vert. opp.$\angle's$ =;$\hat{O}_1 = \hat{P} = 24^0$ $\angle's$ opp. equal sides of a Δ,∴ $\hat{O}_2 = \hat{P} = 24^0$,alt.$\angle's$ RP∥OQ
	D	33^0		$\hat{O}_1 = \hat{P} = 66^0$ $\angle's$ opp. equal sides of a Δ,concled that $\hat{O}_2 = 33^0$

No.		Expected answer	KEY (✓)	Rational
35.	A	48^0		Used: $\widehat{M}_1 = 48^0 \therefore \widehat{Q}_1 = 48^0$
	B	66^0		Used: $\widehat{M}_1 = 66^0$, (∠' s opp.=sides of Δ), then $\widehat{M}_1 = \widehat{Q}_1 = 66^0$
	C	114^0		Used: $\widehat{M}_1 + \widehat{M}_2 = 180^0$ Supp. $\angle s$, $\widehat{M}_2 = \widehat{Q}_1 = 114^0$ corr. $\angle s$ = PQ‖RM
	D	132^0	✓	$\widehat{O} = 48^0$ $\widehat{M}_1 + \widehat{N} = 132^0$ sum $\angle s$ of $\therefore \widehat{M}_1 = \widehat{N} = 66^0$∠' s opp.=sides of Δ $\therefore \widehat{M}_2 = 132°$ suppl ∠s on a str. LineΔ $\widehat{Q}_1 = 132°$ corr ∠′ s PQ‖RM
36.	A	30^0		$\widehat{B}_1 + \widehat{B}_2 = 60^0$ vert. opp.$\angle' s$;$60^0 + 90^0 + x + 10^0 = 180^0$; supp.$\angle' s$ incorrectly used $60^0.; x = 20^0$; $\widehat{F}_1 = \widehat{B}_4 = 20^0 + 10^0 = 30^0$
	B	55^0	✓	$\widehat{B}_1 + \widehat{B}_2 = 60^0$ vert.opp.$\angle' s \therefore \widehat{B}_1 = 35^0$;$35^0 + 90^0 + x + 10^0 = 180^0; x = 45^0$ $\therefore \widehat{F}_1 = \widehat{B}_4 = 45^0 + 10^0 = 55^0$
	C	65^0		$\widehat{B}_1 + \widehat{B}_2 = 60^0$ vert.opp.$\angle' s \therefore \widehat{B}_1 = 35^0$;$35^0 + 90^0 + x = 180^0$; erroneously excluded $10^0; x = 55^0$ $\therefore \widehat{F}_1 = \widehat{B}_4 = 55^0 + 10^0 = 65^0$
	D	60^0		$\widehat{F}_1 = \widehat{B}_5 = 60^0$ incorrectly thought $\widehat{F}_1$ and $\widehat{B}_5$ are corr.$\angle s$
37.	A	A scalene triangle		Lacks knowledge of the properties of equilateral triangle.
	B	An isosceles triangle		Lacks knowledge of the properties of equilateral triangle.
	C	An equilateral triangle	✓	Correct answer.
	D	An equiangular triangle		Lacks knowledge of the properties of equilateral triangle.
38.	A	Triangle 1		Lacks knowledge of the properties of right-angled Δ.
	B	Triangle 2	✓	Correct answer.
	C	Triangle 3		Lacks knowledge of the properties of right-angled Δ.
	D	Triangle 4		Lacks knowledge of the properties of right-angled Δ.

No.		Expected answer	KEY (✓)	Rational
39.	A	60°	✓	$\hat{S}_1 = \hat{T} + \hat{R}_2$ (ext. ∠ of a Δ = sum of opp. int. ∠s) $10z - 30° = 3z - 5° + 5z + 5°$ $2z = 30°$ $z = 15°$ $\therefore \hat{S}_1 = 10(15°) - 30° = 150° - 30° = 120°$ $\hat{S}_1 + y = 180°$ (co − interior ∠s i. e. PS ‖ QR) $\therefore \hat{P} = 60°$
	B	15°		$\hat{S}_1 = \hat{T} + \hat{R}_2$ (ext. ∠ of a Δ = sum of opp. int. ∠s) $10z - 30° = 3z - 5° + 5z + 5°$ $2z = 30°$ $z = 15°$ and did not substitute to calculate
	C	170°		$\hat{S}_1 = \hat{T} + \hat{R}_2$ (ext. ∠ of a Δ = sum of opp. int. ∠s) $10z - 30° = 3z - 5° + 5z + 5°$ $2z = 40°$ (Manipulation error) $z = 20°$ $\therefore \hat{S}_1 = 10(20°) - 30° = 200° - 30° = 170°$
	D	110°		$\hat{S}_1 = \hat{T} + \hat{R}_2$ (ext. ∠ of a Δ = sum of opp. int. ∠s) $10z - 30° = 3z - 5° + 5z + 5°$ $10z - 8z = 30° + 10°$ $2z = 20°$(Manipulation error) $z = 10°$ $\therefore \hat{S}_1 = 10(10°) - 30° = 100° - 30° = 70°$ $\hat{S}_1 + \hat{P} = 180°$ (co − interior ∠s i. e. PS ‖ QR) $\therefore \hat{P} = 110°$
40.	A	A rhombus.		Confused the rhombus and the square.
	B	A parallelogram.		Could not differentiate the properties of quadrilaterals.
	C	A rectangle.		Confused the rectangle and the square due to the four right angles.
	D	A square.	✓	Correct answer

No.		Expected answer	KEY (✓)	Rational
41.	A	Diagonals bisect each other at 90^0.		Lacks knowledge of properties of a parallelogram.
	B	Diagonals bisect the angles at the vertices.		Lacks knowledge of properties of a parallelogram.
	C	Diagonals bisect each other.	✓	Correct answer.
	D	Diagonals are equal.		Lacks knowledge of properties of a parallelogram.
42.	A	A parallelogram.		Could not differentiate between a parallelogram and the properties of a trapezium.
	B	A square.		Did not know the properties of a square in terms of sides, angles and diagonals
	C	A trapezium.	✓	Correct answer.
	D	A rhombus.		Did not know the properties of a rhombus in terms of sides, angles and diagonals.
43.	A	42 cm.		Wrongly added 25 and 17.
	B	40 cm.		Wrongly added 25 and 15.
	C	20 cm.		Only calculated part of diagonal. $ST^2 = TI^2 - SI^2$ $ST^2 = 25^2 - 15^2$ $ST^2 = 400$ $ST = 20$ cm
	D	28 cm.	✓	$ST^2 = TI^2 - SI^2$ $ST^2 = 25^2 - 15^2$ $ST^2 = 400$ $ST = 20$ cm $KS^2 = KI^2 - SI^2$ $KS^2 = 17^2 - 15^2$ $KS^2 = 64$ $KS = 8$ cm $KT = KS + ST$ $KT = 28\,cm$

44.	A	$x = 60°$; ΔIKL is an isosceles triangle.		Used alternate angles and did not substitute to solve for x.
	B	$x = 20°$; ΔIKL is an equilateral triangle.	✓	$\widehat{K}_2 = \hat{l} = 3x$ ... $\angle's$ opp equal sides $\widehat{K}_1 = 120°$ opp $\angle's$ of a parm $\widehat{K}_1 + \widehat{K}_2 = 180°$ suppl $\angle's$ on a str line $\widehat{K}_2 = 60°$ $3x + 60° = 120°$ ext $\angle$ of Δ $3x = 60°$ $x = 20°$ In ΔIKL $\hat{l} = 3(20°) = 60°$ $\therefore \widehat{K}_2 = \hat{l} = \hat{L} = 60°$ $\therefore \Delta IKL$ is an equilateral
	C	$x = 120°$; ΔIKL is an isosceles triangle.		Took $120°$ as is and used the equal markings of the triangle
	D	$x = 180°$; ΔIKL is an equilateral triangle.		Lacks knowledge of properties of a parallelogram.
45.	A	$52°$		Calculated $\hat{E}_1$.
	B	$104°$		Added $\hat{E}_1$ and $\hat{D}_1$.
	C	$76°$	✓	$E2 = 128°$ (opp. $\angle$s of a parm) $E1 = 52°$ ($\angle$s on a str. line) $\hat{D}_1 = 52°$ ($\angle$s opp. = sides, AE = AD) $\therefore E1 + D1 = 104°$ $\therefore A = 76°$ (sum $\angle$s of a Δ)
	D	$128°$		Just used $180° - 52° = 128°$.

46.	A	26,2		$\frac{LN}{KL} = \frac{ML}{MK}$ (Δ MLN ||| Δ MKL) $\frac{LN}{12} = \frac{13}{5}$ $\frac{x+5}{12} = \frac{13}{5}$ $5x = 156 - 25 = 131$ $x = 26{,}2$
	B	29,2		$\frac{LN}{KL} = \frac{ML}{MK}$ (Δ MLN ||| Δ MKL) $\frac{x+5}{12} = \frac{13}{5}$ $5x = 156 - 10 = 146$ $x = 29{,}2$
	C	31,2	✓	$\frac{LN}{KL} = \frac{ML}{MK}$ (Δ MLN ||| Δ MKL) $\frac{LN}{12} = \frac{13}{5}$ $LN = 31{,}2$
	D	36,2		$\frac{LN}{KL} = \frac{ML}{MK}$ (Δ MLN ||| Δ MKL) $\frac{x+5}{12} = \frac{13}{5}$ $5x = 156 + 25 = 181$ $x = 36{,}2$
47.	A	6 cm		ΔABF ||| ΔACD $(\angle\angle\angle)$ Only worked out x. In $\Delta ABF and\ \Delta ACD$: $\frac{4}{4+8} = \frac{3}{x+3} \Rightarrow 4x + 12 = 36 \Rightarrow 4x = 24 \Rightarrow x = 6$
	B	5 cm		ΔADE ||| ΔAFG $(\angle\angle\angle)$ Only worked out x. In $\Delta ADE\ and\ \Delta AFG$: $\frac{4}{4+8} = \frac{y}{y+10} \Rightarrow 4y + 40 = 12y \Rightarrow 8y = 40 \Rightarrow y = 5$ Only worked out y.
	C	11 cm	✓	Correct answer
	D	15 cm		Added $y = 5$ and 10
48.	A	1 m		Subtracted 3 from 4.
	B	3 m		$r = bottom\ side$ took the bottom side as the hypotenuse. $r = 3$
	C	4 m		$r = h$ took the height of the wall as the hypotenuse. $r = 4$
	D	5 m	✓	$r^2 = x^2 + y^2$ $r^2 = 3^2 + 4^2$ $r^2 = 25$ $r = 5$

49.	A	7 cm		Used the length of a side.
	B	49 cm		Multiplied the lengths of two sides.
	C	$\sqrt{98}$ cm	✓	$DB^2 = AB^2 + AD^2$ (Pyth theorem) $DB^2 = 7^2 + 7^2$ $DB^2 = 98$ $DB = \sqrt{98}$ Or $DB^2 = BC^2 + CD^2$ (Pyth theorem) $DB^2 = 7^2 + 7^2$ $DB^2 = 98$ $DB = \sqrt{98}$
	D	$\sqrt{14}$ cm		Determine the square root of the sum of the two sides.
50.	A	9 cm		Equated BE to CD.
	B	12 cm		Subtracted BC from AD.
	C	15 cm	✓	$EB = DC = 9$ (opp sides of a rectangle) $ED = BC = 20$ (opp sides of a rectangle) $AE = AD - ED = 32 - 20 = 12$ $AB^2 = AE^2 + BE^2$ (Pyth theorem) $AB^2 = 12^2 + 9^2$ $AB^2 = 225$ $AB = 15$
	D	21 cm		Added two sides EB and EA.
51.	A	350 cm		$\frac{400\ cm^2}{4} = 100$ cm and subtracted 50 from 400
	B	8 cm	✓	$\frac{400\ cm^2}{50\ cm} = 8$ cm
	C	16 cm		Used wrong formula: $400\ cm^2 = \frac{1}{2} \times 50$ cm $\times\ l; \therefore l = 16$ cm
	D	450 cm		$\frac{400\ cm^2}{4} = 100$ cm and added 50 to 400
52.	A	238,5 cm^2		Area $= \frac{1}{2}\ (30\text{ cm} + 9{,}75\text{ cm}) \times 12\text{ cm} =$ 238,5 cm^2, added the height
	B	105 cm^2		Area $= \frac{1}{2}\ (30\text{ cm} + 12\text{ cm}) \times 5\text{ cm} = 105$ cm^2, ignored the perp. height
	C	312 cm^2		Area $= \frac{1}{2}\ (\ 5\text{ cm} + 12\text{ cm}) \times 30\text{ cm} = 312$ cm^2 added wrong sides of the trapezium
	D	170,6 cm^2	✓	DE= 9,75 cm, Theor.of Pyth. Area $= \frac{1}{2}\ (30\text{ cm} + 5\text{ cm}) \times 9{,}75\text{cm} = 170{,}6$ cm^2.

53.	A	38 cm	✓	QT = 5 cm longer diagonal bisects the shorter diagonal $QR^2 = QT^2 + TR^2$ $QR^2 = 5^2 + 12^2$ $QR^2 = 169$ $QR = 13$ Pyth.theorem Perimeter= 13 cm + 6 cm + 6 cm + 13 cm = 38 cm
	B	36 cm		12 cm + 6 cm + 6 cm + 12 cm = 36 cm, mistakenly confused 12 cm as one of the sides.
	C	28 cm		12 cm + 10 cm + 6 cm = 28 cm, added the given sides.
	D	37 cm		12 cm + 13 cm + 6 cm + 6 cm = 37 cm, took 12 as one of the sides.
54.	A	Area=118.5 m² Perimeter= 57'2 m		Used incorrectly: Area $= \frac{1}{2}(6)$m $\times$ 7,5 m+12 m $\times$ 8 m $= 118{,}5\ m^2$ Perimeter = 11,2 m + 7,5 m + 6 m + 12 m + 8 m + 8 m = 52,7 m
	B	Area=45 096 m² Perimeter=58,7 m		Used incorrectly: Area $= \frac{1}{2}$ 12 m $\times$ 7500 m+12 m $\times$ 8 m $= 45\,096\ m^2$ Perimeter = 11,2 m + 7,5 m + 6 m + 6 m + 12 m + 8 m + (8) m = 58,7 m
	C	Area=118.5 m² Perimeter=48,7 m	✓	Area $= \frac{1}{2}$ 6 m $\times$ 7,5 m+12 m $\times$ 8 m $= 118{,}5\ m^2$ Perimeter = 11,2 m+ 7,5 m + 6 m + 12 m + (8 m − 2 m) + (8 − 2) m = 48,7 m
	D	Area=22 596 m² Perimeter=52,7 m		Used incorrectly: Area $= \frac{1}{2}$ 6 m $\times$ 7500 m+12 m $\times$ 8 m $= 22\,596\ m^2$ Perimeter = (11,2 m) + 7,5 m + 6 m + 12 m + (8 m − 2 m) + (8 − 2) m + (6 − 2) m
55.	A	236 m²		Chose the wrong opening $SA = (l \times b) + 2(b \times w) + 2(l \times w)$ $SA = (8 \times 7) + 2(6 \times 7) + 2(8 \times 6)$ $SA = 236$ m²

	B	244 m²	✓	$SA = 2(l \times b) + 2(b \times w) + (l \times w)$ $SA = 2(8 \times 7) + 2(6 \times 7) + (8 \times 6)$ $SA = 244$ m²
	C	250 m²		Chose the wrong opening $SA = 2(l \times b) + (b \times w) + 2(l \times w)$ $SA = 2(8 \times 7) + (6 \times 7) + 2(8 \times 6)$ $SA = 250$ m²
	D	292 m²		Ignored the opening $SA = 2(l \times b) + 2(b \times w) + 2(l \times w)$ $SA = 2(8 \times 7) + 2(6 \times 7) + 2(8 \times 6)$ $SA = 292$ m²
56.	A	175 m³		Incorrect conversion of the length $V = l \times b \times h$ $V = 2{,}5 \times 7 \times 10$ $V = 175$ m³
	B	1750 m³	✓	$V = l \times b \times h$ $V = 25 \times 7 \times 10$ $V = 1750$ m³
	C	17500 m³		Incorrect conversion of the length $V = l \times b \times h$ $V = 250 \times 7 \times 10$ $V = 17500$ m³
	D	175000 m³		Did not convert the length $V = l \times b \times h$ $V = 2500 \times 7 \times 10$ $V = 175000$ m³

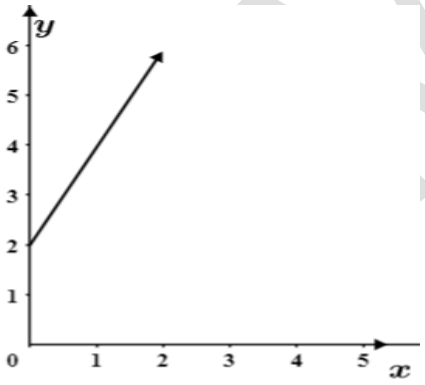
57.	A	2730 cm³		Calculated volume with toy car but did not subtract original volume without toy car. $V = l \times b \times h$ $V = 14 \times 10 \times 19{,}5$ $V = 2730$ cm³
	B	2240 cm³		Calculated volume without the toy car. $V = l \times b \times h$ $V = 14 \times 10 \times 16$ $V = 2240$ cm³
	C	245 cm³		Calculated correctly then divided by two seeing that there are two tanks. $V = l \times b \times h$ $V = 14 \times 10 \times 16$ $V = 2240$ $V = l \times b \times h$ $V = 14 \times 10 \times 19{,}5$ $V = 2730$ $V = 2730 - 2240$ $V = \frac{490}{2}$ $V = 245$ cm^3
	D	490 cm³	✓	$V = l \times b \times h$ $V = 14 \times 10 \times 16$ $V = 2240$ $V = l \times b \times h$ $V = 14 \times 10 \times 19{,}5$ $V = 2730$ $V = 2730 - 2240$ $V = 490$ cm^3
58.	A	188,5 m²	✓	$SA = 2\pi rh + 2\pi r^2$ $SA = 2 \times \pi \times 3 \times 7 + 2 \times \pi \times 3^2$ $SA = 188{,}5$ m²
	B	490,1 m²		Used the diameter to calculate the surface area. $SA = 2\pi rh + 2\pi r^2$ $SA = 2 \times \pi \times 6 \times 7 + 2 \times \pi \times 6^2$ $SA = 490{,}1$ m²
	C	150,8 m²		Did not square the radius. $SA = 2\pi rh + 2\pi r^2$ $SA = 2 \times \pi \times 3 \times 7 + 2 \times \pi \times 3$ $SA = 150{,}8$ m²
	D	301,6 m²		Did not divide the diameter by 2. $SA = 2\pi rh + 2\pi r^2$ $SA = 2 \times \pi \times 6 \times 7 + 2 \times \pi \times 6$ $SA = 301{,}6$ m²

59.	A	20,5 m^2		Did not divide the diameter by 2 and did not square. $SA = 2\pi rh + 2\pi r^2$ $810{,}53 = 2 \times \pi \times 6 \times h + 2 \times \pi \times 6$ $h = 20{,}5$ m
	B	15,5 m^2		Did not divide the diameter by 2. $SA = 2\pi rh + 2\pi r^2$ $810{,}53 = 2 \times \pi \times 6 \times h + 2 \times \pi \times 6^2$ $h = 15{,}5$ m
	C	42 m^2		Did not square the radius. $SA = 2\pi rh + 2\pi r^2$ $810{,}53 = 2 \times \pi \times 3 \times h + 2 \times \pi \times 3$ $h = 42$ m
	D	40 m^2	✓	$SA = 2\pi rh + 2\pi r^2$ $810{,}53 = 2 \times \pi \times 3 \times h + 2 \times \pi \times 3^2$ $h = 40$ m
60.	A	-1 cm		Incorrect factors and lack of knowledge that a radius cannot be negative $SA = 2\pi rh + 2\pi r^2$ $31{,}5 = 2\pi r4 + 2\pi r^2$ $31{,}5 = 8\pi r + 2\pi r^2$ $\frac{31{,}5}{2\pi} = (4r + r^2)$ $r^2 + 4r - 5 = 0$ $(r - 5)(r + 1) = 0$ $r = 5$ or $r = -1$ $r = -1$ cm
	B	-5 cm		Lacks of knowledge that a radius cannot be negative $A = 2\pi rh + 2\pi r^2$ $31{,}5 = 2\pi r4 + 2\pi r^2$ $31{,}5 = 8\pi r + 2\pi r^2$ $\frac{31{,}5}{2\pi} = (4r + r^2)$ $4r + r^2 = 5$ $r^2 + 4r - 5 = 0$ $(r + 5)(r - 1) = 0$ $r = -5$ or $r = 1$ $r = -5$ cm
	C	1 cm	✓	$SA = 2\pi rh + 2\pi r^2$ $31{,}5 = 2\pi r4 + 2\pi r^2$ $31{,}5 = 8\pi r + 2\pi r^2$ $\frac{31{,}5}{2\pi} = (4r + r^2)$ $4r + r^2 = 5$ $r^2 + 4r - 5 = 0$ $(r + 5)(r - 1) = 0$ $r = -5$ or $r = 1$ $r = 1$ cm

	D	5 cm		Incorrect factors $A = 2\pi rh + 2\pi r^2$ $31{,}5 = 2\pi r4 + 2\pi r^2$ $31{,}5 = 8\pi r + 2\pi r^2$ $\frac{31{,}5}{2\pi} = (4r + r^2)$ $4r + r^2 = 5$ $r^2 + 4r - 5 = 0$ $(r - 5)(r + 1) = 0$ $r = 5$ or $r = -1$ $r = 5$ cm
				Section A total: 60

SECTION B

- Do not penalise the learner for the same mistake twice.
- *There are no half marks.*
- Underline errors committed by learners do not place a cross (X).

No.	Expected answer	Rational/Clarification	Mark
61.	$m = 5$ ✓ A  ✓✓✓ AAA	1 mark for the value of m 1 mark for the shape 1 mark for y-intercept 1 mark for all other points plotted correctly.	4
62.	All sides are equal and opposite sides are ‖. Each interior angle $= 90^o$ $VR \parallel QT$ $\hat{V}_1 = 34^0$ (given) $\hat{V}_1 = \hat{R}_1 = 34^0$ (alt $\angle s$ $PQ \parallel RS$) $\hat{R}_1 = \hat{T}_2 = 34^0$ (corr $\angle s$ $VR \parallel QT$) ✓ M $\therefore \hat{V}_1 = \hat{T}_2$ In ΔPVR and ΔSTQ: $\hat{P} = \hat{S} = 90°$ ($\angle s$ of a square) ✓ M PR = QS (opp. sides of a square) ✓ M $\hat{V}_1 = \hat{T}_2 = 34^0$ (proved) $\therefore$ ΔPVR ≡ ΔSTQ ($S\angle\angle$) ✓ CA	1 mark for statement and reason 1 mark for statement and reason 1 mark for statement and reason 1 mark for statement and reason	4

No.	Expected answer	Rational/Clarification	Mark
63.	$GF^2 = EF^2 - EG^2$ (Pyth.theorem) $= 15^2 - 9^2$ ✓ M $= 144$ $GF = 12$ ✓ CA $\therefore GH = 12 - 8$ $= 4$ ✓ CA $EH^2 = GH^2 + EG^2$ (Pyth.theorem) $= 4^2 + 9^2$ $= 97$ ✓ CA $EH = 9{,}85$ ✓ CA	1 mark for substituting into the correct formula 1 mark for $GF = 12$ 1 mark for $GH = 4$ 1 mark for $EH^2 = 97$ 1 mark for $EH = 9{,}85$	5
64.	$SA = 2\pi rh + 2\pi r^2$ SA $= 2(\frac{22}{7})(7)(9) + 2\frac{22}{7}(7^2)$ ✓ M SA = 704 m² ✓ CA	1 mark for substituting into the correct formula 1 mark for correct answer	2
			Section B total: 15