



Unit 1 Revision Sheet B Algebra Foundation & Higher Questions

Q1.

(a) Simplify $4m + 2m - m$

(1)

(b) Simplify $5p \times 7$

(1)

(c) Solve $8g = 40$

(1)

(d) Solve $19 - k = 4$

(1)

(Total for question = 4 marks)

Q2.

(a) Simplify $6e \times 2f$

(1)

(b) Simplify $5m + 7k - 2m + k$

(2)

(c) Solve $5y + 3 = 14$

(2)

(Total for question = 5 marks)

Q3.

(a) Simplify $6m - 2k + 5m - k$

(2)

$P = 2a + 3b$

(b) Work out the value of P when $a = 5$ and $b = 8$

(2)

$P = 2a + 3b$

(c) Work out the value of a when $P = 16$ and $b = 20$

(3)

(Total for question = 7 marks)

**Q4.**

(a) Expand and simplify $(m - 8)(m + 5)$

(2)

(b) Factorise fully $5y + 20y^2$

(2)

(c) Simplify $(p^2 + 3)^0$

(1)

(d) Solve $3(2x - 5) = \frac{9 - x}{2}$

Show clear algebraic working.

(4)

(Total for question = 9 marks)

Q5.

(a) Simplify $5c \times d$

(1)

(b) Solve $x + 5 = 12$

(1)

(c) Solve $9y = 36$

(1)

(d) Simplify $8k + 5m - 2k + 6m$

(2)

(e) Expand $4(3g + 1)$

(1)

(Total for question = 6 marks)

Q6.

(a) Simplify $w \times w \times w \times w \times w$

(1)

(b) Simplify $5a \times 3c$

(1)

(c) Simplify $3e + 2f - e + 5f$

(2)

(d) Solve $5x - 7 = x + 12$

Show clear algebraic working.

(3)

(Total for question = 7 marks)



Q7.

- (a) Solve $5x = 20$ (1)
- (b) Simplify $3a \times 8b$ (1)
- (c) Simplify $8w - 4y + w - 3y$ (2)
- (d) Factorise fully $16 + 12t$ (2)

(Total for question = 6 marks)

Q8.

- (a) Expand $x(5 - x)$ (1)
- (b) Factorise $3y - 21$ (1)
- (c) Make p the subject of the formula $f = 3p - d$ (2)

Sergio buys m boxes of seeds and n packets of seeds.

Each box contains 10 seeds.

Each packet contains 6 seeds.

The total number of seeds that Sergio buys is T .

- (d) Write down a formula for T in terms of m and n . (3)

(Total for question = 7 marks)

Q9.

- (a) Simplify $e^8 \div e^2$ (1)
- (b) Expand and simplify $(x - 3)(x + 1)$ (2)

(Total for question = 3 marks)



Q10.

(a) Simplify $(2x^3y^5)^4$

(2)

(b) (i) Factorise $x^2 + 5x - 36$

(2)

(ii) Hence, solve $x^2 + 5x - 36 = 0$

(1)

(Total for question = 5 marks)

Q11.

(a) Simplify $(3x^2y)^0$

(1)

(b) (i) Factorise $x^2 - 5x - 36$

(2)

(ii) Hence solve $x^2 - 5x - 36 = 0$

(1)

(Total for question = 4 marks)

Q12.

$$T = 6p - 4d$$

(a) Work out the value of T when $p = 8$ and $d = 3$

(2)

$$T = 6p - 4d$$

(b) Work out the value of p when $T = -41$ and $d = 5$

(3)

(c) Solve $4(x - 3) = 7x + 15$

Show clear algebraic working.

(3)

(Total for question = 8 marks)



Q13.

(a) Simplify $p + p + p + p + p + p$

(1)

(b) Simplify $5y^2 + 6y^2 - 3y^2$

(1)

(c) Simplify $e \times e \times e \times e \times e$

(1)

(d) Simplify $5c \times 4d$

(1)

(e) Solve $x - 7 = 19$

(1)

$18^2 + 15^2 - 5^3 = 4n$

(f) Work out the value of n .

(2)

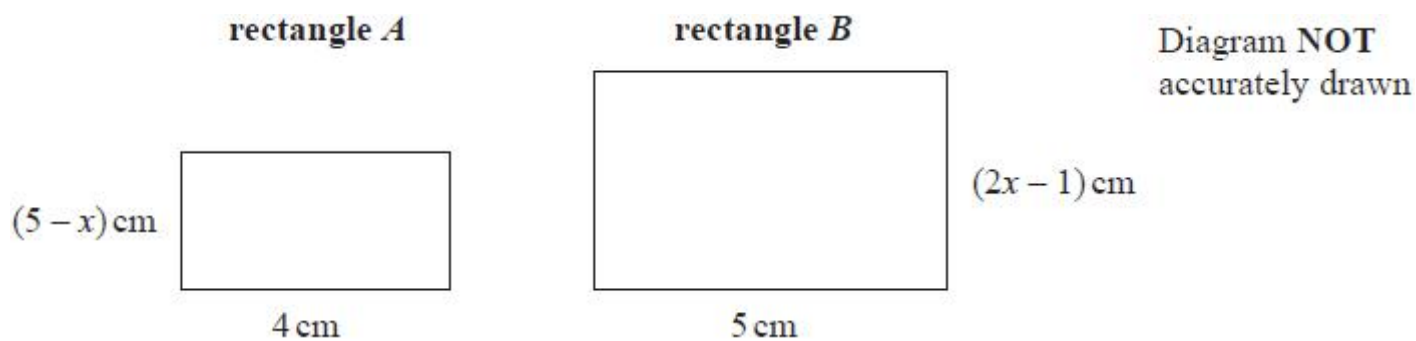
(g) Factorise $9t - 6$

(1)

(Total for question = 8 marks)

Q14.

Here are two rectangles, rectangle A and rectangle B .



The area of rectangle B is twice the area of rectangle A .

Work out the value of x .
Show your working clearly.

(Total for question = 4 marks)



Q15.

(a) Factorise fully $15y^4 + 20uy^3$

(2)

(b) Solve $4 - 3x = \frac{5 - 8x}{4}$

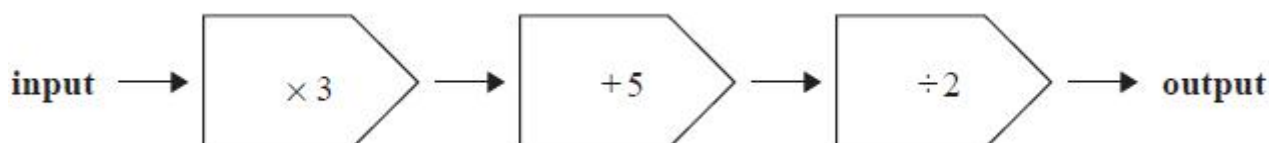
Show clear algebraic working.

(3)

(Total for question = 5 marks)

Q16.

Here is a number machine.



(a) Work out the output when the input is 7

(1)

(b) Work out the input when the output is 160

(2)

When the input is n , the output is P .

(c) Find a formula for P in terms of n .

(2)

(Total for question = 5 marks)

Q17.

(i) Factorise $x^2 + 2x - 24$

(2)

(ii) Hence solve $x^2 + 2x - 24 = 0$

(1)

(Total for question = 3 marks)



Q18.

This formula can be used to work out the cost, in riyals, of hiring a bicycle in Qatar for a number of days.

$$\text{Cost} = 65 \times \text{number of days} + 44$$

Ghalia hired a bicycle in Qatar for 14 days.

(a) Work out the cost.

(2)

This formula can be used to work out the cost, in riyals, of hiring a helmet in Qatar for a number of days.

$$\text{Cost} = 12.5 \times \text{number of days}$$

Kasun wants to hire a bicycle and a helmet for the same number of days.
He wants to hire them for as many days as he can.
He has 750 riyals to spend.

(b) Work out how much of the 750 riyals is not spent.

(4)

(Total for question = 6 marks)



Mark Scheme

Q1.

Question	Working	Answer	Mark	Notes
(a)		$5m$	1	B1
(b)		$35p$	1	B1
(c)		5	1	B1
(d)		15	1	B1

Q2.

Question	Working	Answer	Mark	Notes
(a)		$12ef$	1	B1
(b)		$3m + 8k$	2	B2 B1 for $3m$ or $(+) 8k$
(c)	$5y = 14 - 3$ or $5y = 11$ or $3 - 14 = -5y$ or $-11 = -5y$		2	M1
		$2\frac{1}{5}$		A1 for $2\frac{1}{5}$ or $\frac{11}{5}$ oe or 2.2
Total 5 marks				

Q3.

Question	Working	Answer	Mark	Notes
(a)		$11m - 3k$	2	B2 If not B2 then award B1 for either $11m$ or $-3k$
(b)	$2 \times 5 + 3 \times 8$ or $10 + 24$		2	M1 for substituting the values of a and b into P
		34		A1
(c)	$16 = 2a + 3 \times 20$ or $16 = 2a + 60$	$P - 3b = 2a$	3	M1 for substituting the values of P and b into the equation or rearranging the equation $P = 2a + 3b$ for $2a$ correctly
	$16 - 60 = 2a$ $-44 = 2a$ oe or	$16 - 2 \times 30 = 2a$ or $16 - 60 = 2a$		M1 for rearranging the equation for $2a$ correctly or substituting the values of P and b into the correctly rearranged equation
		-22		A1
Total 7 marks				



Q4.

Question	Working	Answer	Mark	Notes
(a)	$m^2 - 8m + 5m - 40$		2	M1 for any 3 correct terms or for 4 out of 4 correct terms ignoring signs or for $m^2 - 3m \dots$ or for $\dots - 3m - 40$
		$m^2 - 3m - 40$		A1
(b)		$5y(1 + 4y)$	2	B2 If not B2 then award B1 for $5(y + 4y^2)$ or $y(5 + 20y)$ or $5y(a + 4y)$ where a is an integer and $a \neq 0$ or $5y(1 + by)$ where b is an integer and $b \neq 0$
(c)		1	1	B1
(d)	E.g. $6x - 15$ or $12x - 30$ oe		4	M1 for expansion of a correct bracket
	$2 \times 3(2x - 5) = 9 - x$ oe or $2('6x - 15') = 9 - x$ oe or $3(2x - 5) = \frac{9}{2} - \frac{x}{2}$ oe			M1 for removal of fraction or separating fraction (RHS) in an equation
	$12x + x = 9 + 30$ oe or $6x + \frac{x}{2} = \frac{9}{2} + 15$ oe			M1 ft (dep on 4 terms) for terms in x on one side of equation; number terms on the other
		3		A1 dep on at least M2 awarded
				Total 9 marks

Q5.

Q	Working	Answer	Mark	Notes
(a)		$5cd$	1	B1
(b)		7	1	B1
(c)		4	1	B1
(d)		$6k + 11m$	2	B2 If not B2 then award B1 for $6k$ or $11m$
(e)		$12g + 4$	1	B1
				Total 6 marks



Q6.

Q	Working	Answer	Mark	Notes
(a)		w^5	1	B1
(b)		$15ac$	1	B1 or $a15c$ or $ac15$ or $c15a$ oe (NB: no multiplication signs)
(c)		$2e + 7f$	2	B2 (B1 for $2e$ or $+7f$ or $7f$ but not for $-7f$) Do not isw so if you see $2e + 7f = 9ef$ award B1 only
(d)	eg $5x - x = 12 + 7$ or $-7 - 12 = x - 5x$ or $4x - 7 = 12$ or $5x = x + 19$ oe		3	M1 for rearrangement with x terms on one side and numerical terms on the other in a correct equation or the correct simplification of x terms or numbers on one side in a correct equation
	$4x = 19$ or $-4x = -19$			M1 x terms simplified and number terms simplified correctly in an equation
	<i>Working required</i>	4.75		A1 oe, eg $\frac{19}{4}$ or $4\frac{3}{4}$ dep on M1
				Total 7 marks

Q7.

Question	Working	Answer	Mark	Notes
(a)		4	1	B1
(b)		$24ab$	1	B1 accept $ab24$ etc. but no \times signs
(c)	$8w + w$ or $-4y (+) - 3y$		2	M1 M1 for $9w$ or $-7y$
		$9w - 7y$		A1
(d)		$4(4 + 3t)$ oe	2	B2 if not B2 then B1 for $2(8 + 6t)$
				Total 6 marks



Q8.

Question	Working	Answer	Mark	Notes
(a)		$5x - x^2$	1	B1
(b)		$3(y - 7)$	1	B1
(c)	$f + d = 3p$ or $\frac{f}{3} = p - \frac{d}{3}$		2	M1 A correct first stage in a correct formula
		$p = \frac{f+d}{3}$		A1 for $p = \frac{f+d}{3}$ (must see p = ... at some stage) (SCB1 for $p = \frac{f-d}{3}$)
(d)		$T = 10m + 6n$	3	B3 for $T = 10m + 6n$ oe
				(B2 for $10m + 6n$ or $T = 10m + an$ or $T = bm + 6n$ or $T = 6m + 10n$)
				(B1 for $10m + an$ or $bm + 6n$ or $6m + 10n$) or for $T =$ an incorrect expression in m and n
Total 7 marks				

Q9.

Q	Working	Answer	Mark	Notes
(a)		e^6	1	B1 cao
(b)	$x^2 - 3x + x - 3$		2	M1 for any 3 correct terms or for 4 out of 4 correct terms ignoring signs or for $x^2 - 2x \dots$ or for $\dots - 2x - 3$
	Correct answer scores full marks (unless from obvious incorrect working)	$x^2 - 2x - 3$		A1
Total 3 marks				



Q10.

Q	Working	Answer	Mark	Notes
(a)		$16x^{12}y^{20}$	2	B2 B1 for an answer in the form ax^ny^m with 2 correct from $a = 16, n = 12, m = 20$
(b)(i)	$(x \pm 9)(x \pm 4)$		2	M1 for $(x \pm 9)(x \pm 4)$ or for $(x + a)(x + b)$ where $ab = -36$ or $a + b = 5$
		$(x + 9)(x - 4)$		A1
(ii)		$-9, 4$	1	B1 ft from (b)(i)
Total 5 marks				

Q11.

Q	Working	Answer	Mark	Notes
(a)		1	1	B1
(b)(i)	$(x \pm 4)(x \pm 9) (= 0)$		2	M1 or $(x + a)(x + b)$ where $ab = -36$ or $a + b = -5$
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	$(x + 4)(x - 9)$		A1 (isw if they also solve the equation in this part)
(ii)	<i>Answers must fit from (b)(i)</i>	-4 and 9	1	B1 ft Answer must fit from their $(x + p)(x + q)$ in (b)(i) Award B0 for -4 and 9 if no marks scored in (i)
Total 4 marks				



Q12.

Q	Working	Answer	Mark	Notes
(a)	$6 \times 8 - 4 \times 3$		2	M1
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	36		A1
(b)	$-41 = 6 \times p - 4 \times 5$ or $6p = T + 4d$ or $6p = -41 + 4 \times 5$		3	M1 for correct substitution into the correct formula or a correct rearrangement for $6p$
	$6p = -41 + 20$ or $6p = -21$ $-6p = 41 - 20$ or $-6p = 21$ $p = \frac{-41+20}{6}$ or $p = \frac{41-20}{-6}$			M1
	<i>Correct answer scores full marks (unless from obvious incorrect working)</i>	$-\frac{7}{2}$		A1 Oe If no marks awarded SCB1 for -266
(c)	$4x - 12$ or $x - 3 = \frac{7x}{4} + \frac{15}{4}$ oe		3	M1 for a correct expansion of bracket or division of all terms in a correct equation by 4
	$4x - 7x = 15 + 12$ or $-12 - 15 = 7x - 4x$ or $-3x = 27$ or $-27 = 3x$			M1 for a correct rearrangement within a correct equation with x terms on one side and the numbers on the other side
	<i>Working required</i>	-9		A1 dep on M1 (SCB1 for an answer of $x = -6$ with working shown from $4x - 3 = 7x + 15$)
Total 8 marks				

Q13.

Q	Working	Answer	Mark	Notes
(a)		$6p$	1	B1
(b)		$8y^2$	1	B1
(c)		e^5	1	B1
(d)		$20cd$	1	B1
(e)		26	1	B1
(f)	$424 = 4n$	106	2	M1 For 424 or $324 + 225 - 125$ with at most one error
				A1 SCB1 for 524 or 674
(g)		$3(3t - 2)$	1	B1
Total 8 marks				



Q14.

Q	Working	Answer	Mark	Notes
	$4 \times (5 - x)$ or $5 \times (2x - 1)$ or $20 - 4x$ or $10x - 5$ oe		4	M1 for setting up a correct algebraic expression for area A or area B (could be seen as part of an equation) (condone lack of brackets for multiplying if meaning is clear for this mark only)
	<div> one from: $4(5 - x) = 20 - 4x$ or $2 \times 4(5 - x) = 40 - 8x$ or $0.5 \times 4(5 - x) = 10 - 2x$ oe </div> <div> and one from: $5(2x - 1) = 10x - 5$ or $2 \times 5(2x - 1) = 20x - 10$ or $0.5 \times 5(2x - 1) = 5x - 2.5$ oe </div>			M1 for expanding 2 sets of brackets correctly (one for each shape) [allow $\times 2$ or $\div 2$ for the wrong shape for this mark] Need not be in an equation at this stage.
	eg $10x + 8x = 40 + 5$ or $-5 - 40 = -10x - 8x$ or $18x = 45$ or $-45 = -18x$ or $4x + 5x = 20 + 2.5$ oe			M1 for a <u>correct</u> equation with terms in x on one side and number terms the other side
	<i>Working required</i>	2.5		A1 oe dep on M1
				Total 4 marks



Q15.

Q	Working	Answer	Mark	Notes
(a)		$5y^3(3y + 4u)$	2	B2 for $5y^3(3y + 4u)$ (B1 for $5y(3y^3 + 4uy^2)$ or $5y^2(3y^2 + 4uy)$ or $y^2(15y^2 + 20uy)$ or $y^3(15y + 20u)$ or $5y^3(\dots)$ where there is only one mistake in the brackets)
(b)	$4 \times (4 - 3x) = 5 - 8x$ oe or $16 - 12x = 5 - 8x$ oe or $4 - 3x = \frac{5}{4} - 2x$ oe		3	M1 for removal of fraction in a correct equation
	e.g. $16 - 5 = 12x - 8x$ or $11 = 4x$ oe or $4 - \frac{5}{4} = 3x - 2x$			M1 for terms in x on one side and numbers on the other side in an equation, allow correct rearrangement of their equation in the form $ax + b = cx + d$
		2.75		A1 (dep on M1) oe e.g. $2\frac{3}{4}$ or $\frac{11}{4}$
Total 5 marks				

Q16.

Q	Working	Answer	Mark	Notes
(a)		13	1	B1
(b)	$160 \times 2 (=320)$ or “ 160×2 ” – 5 or “ $160 \times 2 - 5$ ” $\div 3$	105	2	M1 One correct inverse operation used A1
(c)		$P = \frac{3n+5}{2}$	2	B2 oe (B1 for $\frac{3n+5}{2}$ oe or $P = 3n + 5 \div 2$ or for $P =$ a formula including n with 2 operations correct eg $P = 3n + 5$ or for $n = \frac{2P-5}{3}$ or $P = \frac{2n-5}{3}$)
Total 5 marks				



Q17.

Q	Working	Answer	Mark	Notes
(i)	$(x \pm 6)(x \pm 4)$		2	M1 or $(x + a)(x + b)$ where $ab = -24$ or $a + b = 2$
	<i>Working not required, so correct answer scores full marks</i>	$(x + 6)(x - 4)$		A1
(ii)	<i>Answer must come from the factors in (i) as the questions says 'Hence solve...'</i>	-6, 4	1	B1 Must follow through from their factors in (i), so even if the answers 8 and -6 are given, the mark can only be awarded if it follows from the factorisation in (i) (dep on 2 factors)
				Total 3 marks
				NB: Some students may show the whole of their working in the space for (i) or (ii). Please award the marks for (i) and (ii) so long as there is no ambiguity.



Q18.

Q	Working	Answer	Mark	Notes
(a)	$65 \times 14 + 44$ oe eg $910 + 44$		2	M1
	<i>Working not required, so correct answer scores full marks (unless from obvious incorrect working)</i>	954		A1
(b)	$750 - 44 (= 706)$		4	M1
	$"706" \div (65 + 12.5) (= 9.109...)$			M1 dep or clearly adding at least 5 lots of $(65 + 12.5)$ ($77.5, 155, 232.5, 310, 387.5, 465, 542.5, 620, 697.5$)
	$"706" - "9" \times (65 + 12.5)$ oe eg $"706" - 697.5$			M1 For the sum of $(65 + 12.5)$ to the value under $"706"$ with no more than one error and subtracting from $"706"$
	<i>Working not required, so correct answer scores full marks (unless from obvious incorrect working)</i>	8.5[0]		A1
	Alternative method for (b)			Total 6 marks
	$750 \div (65 + 12.5)(=9.677...) \text{ oe}$		4	M1
	$750 - "9" \times (65 + 12.5) (= 52.5) \text{ oe}$			M1
	$52.5 - 44$			M1
	<i>Working not required, so correct answer scores full marks (unless from obvious incorrect working)</i>	8.5[0]		A1