

TAFE ID	329428800	Result Slip No	S2277003
Student Name	Rachel Loveday	Date marked	22/06/2021

**Student Feedback
Mathematics
Assignment 6492MD 1**

Result	$\frac{16.5}{45} = 37\%$
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	Max mark	mark	Teacher's Comments
Q1 to 10			
1	1	1	B
2	1	0	C
3	1	1	C
4	1	1	D
5	1	0	D
6	1	0	C
7	1	0	B
8	1	0	B
9	1	0	D
10	1	0	C

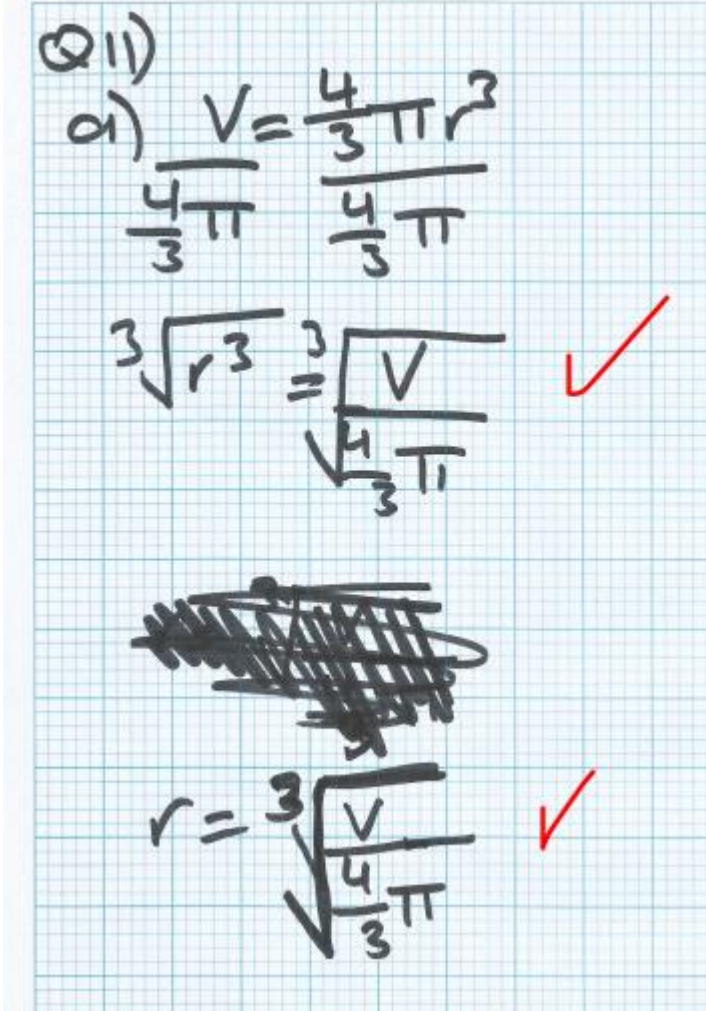
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	Max mark	mark	Teacher's Comments
			① 2mm Square Assignment 1 Q1) BB ✓ Q2) B ✗ Q3) C ✓ Q4) D ✓ Q5) B ✗ Q6) B ✗ Q7) A ✗ Q8) D ✗ Q9) A ✗ Q10) D ✗
			Rachel, please see my solutions below: Q2: $x^n(x^{6n})^{-\frac{1}{2}} = x^n x^{6n \times (-\frac{1}{2})} = x^n x^{-3n} = x^{n-3n} = x^{-2n} \therefore C$ Q5: $\sqrt{72} = \sqrt{36 \times 2} = 6\sqrt{2} \therefore D$ is the best answer. Note: B $3\sqrt{8}$ can be simplified further. Q6: $\sqrt{5} + \sqrt{45} - 3\sqrt{20} = \sqrt{5} + \sqrt{9 \times 5} - 3\sqrt{4 \times 5} = 1\sqrt{5} + 3\sqrt{5} - 6\sqrt{5} = -2\sqrt{5} \therefore C$

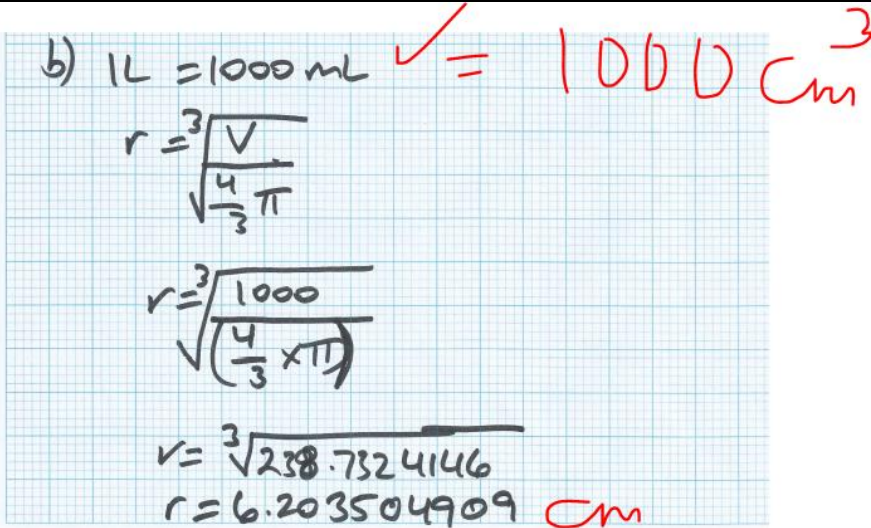
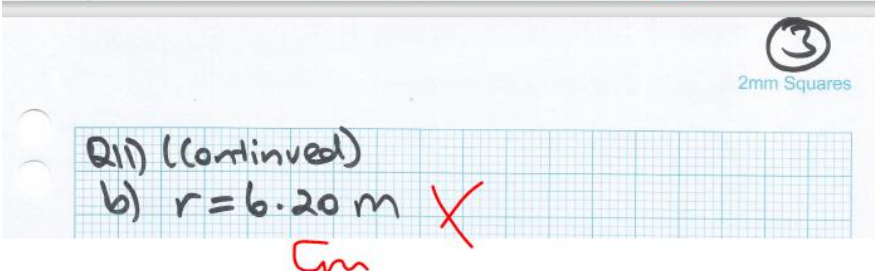
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			Q7: $2\sqrt{3} \times 5\sqrt{12} = 10\sqrt{36} = 10 \times 6 = 60 \therefore B$ Q8: The first step is to multiply both sides by 2 then divide by m. Finally, take the square root of both sides. B gives the correct answer. $E = \frac{1}{2} m v^2$ $\frac{2E}{m} = v^2$ $\pm \sqrt{\frac{2E}{m}} = v$ Q9: $x^{\frac{2}{3}} = 16$ $\left(x^{\frac{2}{3}}\right)^{\frac{3}{2}} = 16^{\frac{3}{2}}$ $x = \sqrt{16^3}$ $x = \sqrt{4096}$ $x = 64 \therefore D$ Q10: A and B have an irrational denominator so the answer can only be C or D. Rationalise the expression: $\frac{\sqrt{3}}{\sqrt{3}-2} = \frac{\sqrt{3}}{\sqrt{3}-2} \times \frac{\sqrt{3}+2}{\sqrt{3}+2} = \frac{3+2\sqrt{3}}{3-4} = \frac{3+2\sqrt{3}}{-1} = -3 - 2\sqrt{3} \therefore C$
total	10	3	
Q11			
a	1	1	some correct simplification
	1	0.5	Correct answer

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			 Rachel, it is better if you multiply by 3 first, then divide by 4π separately: $V = \frac{4}{3}\pi r^3$ $r^3 = \frac{3V}{4\pi}$ $r = \sqrt[3]{\frac{3V}{4\pi}}$
b	1	0	correct units
	1	0.5	correct diameter in metres, -0.5 for incorrect sig figs (3)

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			  Rachel, litre is a unit for capacity. When working with a volume formula, you must convert 1 Litre to a volume unit, cubic metres for example: $1000L = 1m^3 = 100cm \times 100cm \times 100cm = 1\,000\,000\,cm^3$ $1L = 0.001m^3 = 1\,000\,cm^3$ Both can be substituted. Just watch that you get the corresponding unit. $r = \sqrt[3]{\frac{3 \times 0.001}{4\pi}} = 0.06203 \dots m$ diameter = $2r = 0.12407 \dots m = 0.124$ to 3 sig figs
Q11 total	4	2	
Q12			
	1	1	Correct use of conjugate
	1	0	Correct multiplication
	1	0	Correct answers for x and y

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		Q12) $\frac{\sqrt{6}-\sqrt{5}}{\sqrt{6}+\sqrt{5}}$ $\frac{\sqrt{6}-\sqrt{5}}{\sqrt{6}+\sqrt{5}} \times \frac{\sqrt{6}-\sqrt{5}}{\sqrt{6}-\sqrt{5}} = \frac{(\sqrt{6}-\sqrt{5})(\sqrt{6}-\sqrt{5})}{(\sqrt{6})^2 - (\sqrt{5})^2}$ $= \frac{\sqrt{36} - \sqrt{30} + \sqrt{25}}{6 - 5}$ $= \frac{6 - \sqrt{30} + 5}{1}$ $\therefore = 6 - \sqrt{30} + 5$ X Q12) Hence find the values of x and y if $\frac{\sqrt{6}-\sqrt{5}}{\sqrt{6}+\sqrt{5}} = x - y\sqrt{30}$ ④ $\frac{\sqrt{6}-\sqrt{5}}{\sqrt{6}+\sqrt{5}} = x - y\sqrt{30}$ $\frac{\sqrt{6}-\sqrt{5}}{\sqrt{6}+\sqrt{5}} \times \frac{\sqrt{6}-\sqrt{5}}{\sqrt{6}-\sqrt{5}} = \frac{\sqrt{6}-\sqrt{5}(\sqrt{6}-\sqrt{5})}{(\sqrt{6}+\sqrt{5})(\sqrt{6}-\sqrt{5})}$ $= \frac{(\sqrt{6})^2 - \sqrt{30} + \sqrt{25}}{(\sqrt{6})^2 - (\sqrt{5})^2}$ $= \frac{6 - \sqrt{30} + 5}{6 - 5}$ $= 6 - \sqrt{30} + 5$ $= -\sqrt{24} - 5$ X $\therefore x = 24, y = 5$ X

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			Rachel, please observe mu solution below: $\frac{\sqrt{6}-\sqrt{5}}{\sqrt{6}+\sqrt{5}} = \frac{\sqrt{6}-\sqrt{5}}{\sqrt{6}+\sqrt{5}} \times \frac{\sqrt{6}-\sqrt{5}}{\sqrt{6}-\sqrt{5}}$ $= \frac{6-2\sqrt{30}+5}{6-5}$ $= 11-2\sqrt{30}$ $11-2\sqrt{30} = x-y\sqrt{30}$ $\therefore x=11, \quad y=2$
Q12 total	3	1	
Q13			
a	1	0.5	Correct factorization
b	1	0	Correct factorization
c	1	1	Correct step: multiplying by reciprocal
	2	2	Correct answer
			Q13) a) $5b^2c - 15b^3c^2$ The highest common factor is $5b^2$ X $\therefore 5b^2(bc - 3bc^2)$ How about c? a: Factorise fully: 5, b^2 and c are the common factors. $5b^2c - 15b^3c^2 = 5b^2c(1-3bc)$

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			b) $2 - 2a - b(1 - a)$ The highest common factor is 2 $\therefore (2 - 2a) - b(1 - a)$ Highest common factor is $1 - a$ $(2 - 2a) - b(1 - a)$ $2(1 - a) - b(1 - a)$ $= (1 - a)(2 - b)$ $\times$ b: $2 - 2a + b(1 - a) = 2(1 - a) + b(1 - a) = (1 - a)(2 + b)$ c) $\frac{5b^2c - 15b^3c^2}{2 - 2a + b(1 - a)} \div \frac{5b^2}{1 - a}$ $= \frac{5b^2(bc - 3b^2c^2)}{(1 - a)(1 - b)} \div \frac{5b^2}{1 - a}$ $= \frac{bc - 3b^2c^2}{1 - b}$ c: Use your answers from parts a and b in the first fraction, then multiply by reciprocal of the second fraction. Finally, simplify by $5b^2$ and $(1 - a)$. $\frac{5b^2c - 15b^3c^2}{2 - 2a + b(1 - a)} \div \frac{5b^2}{1 - a} =$

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			$\frac{5b^2c(1-3bc)}{(1-a)(2+b)} \times \frac{1-a}{5b^2} = \frac{c(1-3bc)}{2+b}$
Q13 total	5	3.5	
Q14			
a	1	1	Correct factorization
b	1	1	Correct factorization
c	1	0	Correct common denominator
	2	0	Correct answer
			Q14) $x^2 + 9x + 20$ (6) $a+b$ ab $a+b = 9$ ✓ $ab = 20$ ✓ $20 = 4 \times 5$ or 10×2 $= 4 + 5 = 9$ So $a = 4$ $b = 5$ ✓ So $x^2 + 9x + 20 = (x+4)(x+5)$ ✓ Check: $(x+4)(x+5) = x^2 + 9x + 20$ $= x^2 + 4x + 5x + 20$ $= x^2 + 9x + 20$

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		incorrect b) $x^2 - 25$ $\sqrt{x^2} - \sqrt{25}$ $= x - 5$ $= (x-5)(x+5)$ ✓ Check = $(x-5)(x+5)$ $x \times x = x^2$ -5×5 $-5 \times 5 = -25$ $\therefore x^2 - 25$ Q14) ⑦ c) $\frac{1}{x^2+9x+20} - \frac{1}{x^2-25} = \frac{\cancel{0}}{9x-5}$ X $1-1=0$ $x^2-x^2=0$ $20-25=-5$ $\therefore \frac{0}{9x-5}$ $= 9x-5$ X c: Rachel, use your answers from parts a and b in the first fraction, then find the common denominator which is the product of the three factors. Finally, simplify in the numerator:

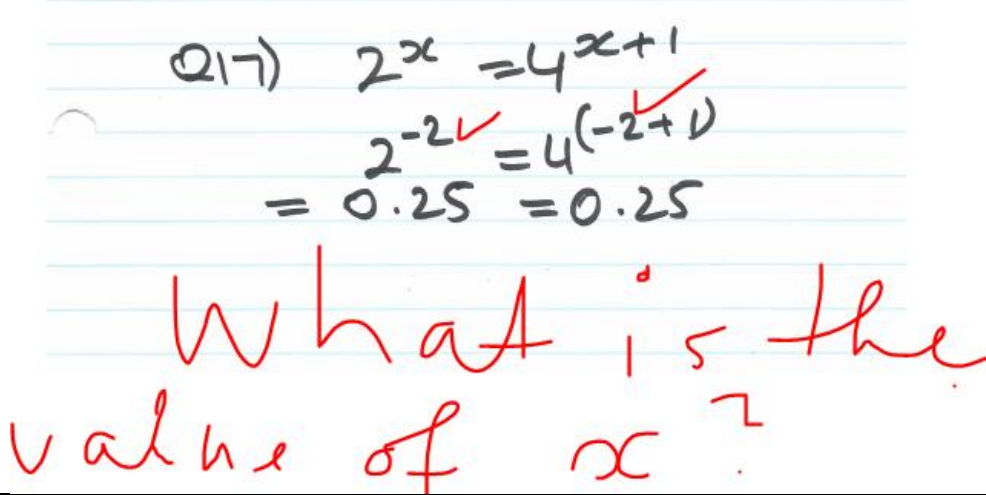
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			$\frac{1}{x^2+9x+20} - \frac{1}{x^2-25} = \frac{1}{(x+5)(x+4)} - \frac{1}{(x+5)(x-5)}$ $\frac{(x+5) - (x+4)}{(x+5)(x+4)(x-5)} = \frac{-9}{(x+5)(x+4)(x-5)}$ Note: It is not necessary to expand the brackets in the denominator, factored form is preferred.									
Q14 total	5	2										
Q15												
	2	1	1 for each answer									
			Rachel, this is an absolute value equation and most have two solutions. Remember, there are two numbers whose absolute value gives 7: $ 7 = 7$ and $ -7 = 7$.									
			$ 2x - 3 = 7$ <table> <tr> <td>$2x - 3 = 7$</td> <td>or</td> <td>$2x - 3 = -7$</td> </tr> <tr> <td>$2x = 10$</td> <td></td> <td>$2x = -4$</td> </tr> <tr> <td>$x = 5$</td> <td></td> <td>$x = -2$</td> </tr> </table>	$2x - 3 = 7$	or	$2x - 3 = -7$	$2x = 10$		$2x = -4$	$x = 5$		$x = -2$
$2x - 3 = 7$	or	$2x - 3 = -7$										
$2x = 10$		$2x = -4$										
$x = 5$		$x = -2$										
			Q15) $[2x - 3] = 7$ $\frac{2x}{2} = \frac{10}{2}$ $x = 5 \checkmark$ Check: $[2x - 3] = 7$ $[(2 \times 5) - 3] = 7$ $[10 - 3] = 7$ $7 = 7$									
Q15 total	2	1										
Q16												
	2	2	1 for some correct simplification. 1 for answer									

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			(8) Q16) $8 - 3z = 5(2 - z) + 9$ $8 - 3z = 10 - 5z + 9$ ✓ $+5z$ $+5z$ $8 + 2z = 10 + 9$ $8 + 2z = 19$ -8 -8 $\frac{2z}{2} = \frac{11}{2}$ ✓ $z = 5.5$ ✓ Check: $8 - (3 \times 5.5) = 10 - (5 \times 5.5) + 9$ $8 - 16.5 = 10 - 27.5 + 9$ $\therefore -8.5 = -8.5$
Q16 total	2	2	
Q17			
	1	1	convert to common base
	1	0	Answer stating $x = -2$
			$2^x = 4^{x+1}$ $2^x = (2^2)^{x+1}$ $2^x = 2^{2x+2}$ The bases are the same so the exponents must be equal: $x = 2x + 2$ $-x = 2$ $x = -2$

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			 Q17) $2^x = 4^{x+1}$ $2^{-2} = 4^{(-2+1)}$ $= 0.25 = 0.25$ What is the value of x?
Q17 total	2	1	
Q18			
	1	1	some correct simplification
	1	0	answer

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			⑨ Q18) $\frac{t+3}{4} > \frac{3t-1}{3}$ $4 \cdot \frac{t+3}{4} > \frac{3t-1}{3} \cdot 4$ $3t > 12t - 4$ ✓ $-12t \quad -12t$ $-9t > -4$ ✓ $\frac{-9t}{-9} > \frac{-4}{-9}$ $t > 0.44$ ✗ Check $\frac{0.44}{4} > \frac{(3 \times 0.44) - 1}{3}$ $= 0.11 > 0.11$ $-9t > -4$ Rachel, when you divide both sides by -9 which is a negative number, the inequality sign must be changed: $t < \frac{4}{9}$
Q18 total	2	1	
Q19			
	2	0	Correct factorisation
	1	0	2 correct answers. 0.5 each

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			$\left. \begin{array}{l} 3x \times 2 = 6x \\ 10 \times x = 10x \end{array} \right\} 16x, \text{ wA } 19x$ (10) Q19) $3x^2 + 19x + 20 = 0$ $= (3x + 10)(x + 2) \quad \times$ $= 3x \times x \quad \times$ $= 3x^2$ $= 10 \times 2$ $= 20$ $\therefore 3x + 10 = 0 \text{ or } x + 2 = 0$ $3x = -10 \text{ or } x = -2$ $\frac{3x}{3} = \frac{-10}{3}$ $x = -3.3\bar{3}$ $x = -3.3\bar{3} \text{ or } 2 \quad \times$ Rachel, this is a quadratic equation for $3x$ or x if you divide all the terms by 3. To solve it, you may use factorisation or the quadratic formula. $3x^2 + 19x + 20 = 0$ $(3x)^2 + 19(3x) + 60 = 0$ $(3x + 4)(3x + 15) = 0$ $x = \frac{-4}{3} \text{ or } x = -5$
Q19 total	3	0	
Q20			
	1	0	Expands and rearranges the equation to $x^2 - x - 12 = 0$
	1	0	Correct factorization
	1	0	Correct answers

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			Q20) $(x+1)(x-2)=10$ $\begin{array}{r} x^2 - 2 = 10 \\ -10 \quad -10 \end{array}$ $x^2 - 2 - 10 = 0$ $x^2 - 12 = 0$ $\times (x+2)(x-6)=0$ $\therefore x+2=0$ or $x-6=0$ $x = -2$ or $+6$ $\times \quad \times$ Rachel, you need to have four, not two terms when you expand the brackets. $(x+1)(x-2) = 10$ $x^2 - 2x + x - 2 = 10$ $x^2 - x - 12 = 0$ $(x+3)(x-4) = 0$ $x = -3 \text{ or } x = 4$
Q20 total	3	0	
Q21			
	1	0	substitution
	1	0	simplification
	2	0	two pairs of answers ($x = 5$ and $y = 24$ or $x = -5.25$ and $y = 26.5625$)

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			⑪ Q21) $y = x^2 - 1$ and $x + 4y - 101 = 0$ ① $y = x^2 - 1$ $8 = 3^2 - 1$ $8 = 9 - 1$ $8 = 8$ $\therefore x = 3, y = 8$ X ② $x + 4y - 101 = 0$ $3 + 4y - 101 = 0$ $\quad \quad +101 \quad +101$ $-3 + 4y = 101$ $\quad -3 \quad -3$ $4y = 98$ $\frac{4y}{4} = \frac{98}{4}$ $y = 24.5$ X $\therefore x = 3, y = 24.5$ X Rachel, these are simultaneous equations, containing two variables, x and y so expect to find x and y values together. Substitute $y = x^2 - 1$ into $x + 4y - 101 = 0$ $x + 4(x^2 - 1) - 101 = 0$ $4x^2 + x - 105 = 0$ $4x^2 - 20x + 21x - 105 = 0$ $4x(x - 5) + 21(x - 5) = 0$ $(4x + 21)(x - 5) = 0$ $\frac{-21}{4} = -5 \frac{1}{4} = -5.25$ and $y = \frac{425}{16} = 26 \frac{9}{16} = 26.5625$ or $x = 5$ and $y = 24.$
Q21 total	4	0	

Teacher's Comment

Rachel,

Unfortunately, your mark falls below 50%. You did not demonstrate you have the necessary

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algebraic skills to do well in Mathematics Advanced course. I recommend that you continue with the Mathematics Standard (yr12) subject. Please contact your maths teachers for further advice.

Regards,

Anna Fazekas