SUGGESTED ANSWER MAT112 – SET 4 QUIZ - 10% (OCTOBER 2022)

| Fraction | | | | |
|---------------------|---|---|--|--|
| | Decimal | Percentage (| %) | |
| $2\frac{7}{14}$ | 2.5 B1 | 250 % | B1 | 3 |
| 691 20 B1 | 34.55 | 3455 % | | |
| | 10 + 8 - 16y = -3 + $18 - 16y = -3 + $ $-16y - 3y = -3 - $ $-19y = -21$ | -3y M1 3y ¹⁸ M1 | | 3 |
| | $\frac{2(3y+6)-y}{8} = 6$ $6y+12-y=48$ $5y=48$ $5y=36$ | M1 M1 -12 | | 4 |
| | 691 B1 | $\frac{691}{20} \textbf{B1} \qquad 34.55$ $10 + 2(4 - 8y) = -3(10 + 8 - 16y) = -3 + 18 - 16y = -3 + 18 - 16y = -3 + 16y = -3 + 16y = -21$ $y = \frac{21}{19}$ $\frac{3(y + 2)}{4} - 6 = \frac{y}{8}$ $\frac{3y + 6}{4} - \frac{y}{8} = 6$ $\frac{2(3y + 6) - y}{8} = 6$ $6y + 12 - y = 48$ $5y = 48 - 5y = 36$ | $\frac{691}{20} \textbf{B1} \qquad 34.55 \qquad 3455 \%$ $10 + 2(4 - 8y) = -3(1 - y)$ $10 + 8 - 16y = -3 + 3y \qquad \textbf{M1}$ $18 - 16y = -3 + 3y$ $-16y - 3y = -3 - 18$ $-19y = -21$ $y = \frac{21}{19} \qquad \textbf{A1}$ $\frac{3(y + 2)}{4} - 6 = \frac{y}{8}$ $\frac{3y + 6}{4} - \frac{y}{8} = 6 \qquad \textbf{M1}$ $\frac{2(3y + 6) - y}{8} = 6 \qquad \textbf{M1}$ $6y + 12 - y = 48 \qquad \textbf{M1}$ $5y = 48 - 12$ $5y = 36$ | $\frac{691}{20} \textbf{B1} \qquad 34.55 \qquad 3455 \%$ $10 + 2(4 - 8y) = -3(1 - y)$ $10 + 8 - 16y = -3 + 3y \qquad \textbf{M1}$ $18 - 16y = -3 + 3y$ $-16y - 3y = -3 - 18$ $-19y = -21$ $y = \frac{21}{19} \qquad \textbf{A1}$ $\frac{3(y + 2)}{4} - 6 = \frac{y}{8}$ $\frac{3y + 6}{4} - \frac{y}{8} = 6 \qquad \textbf{M1}$ $\frac{2(3y + 6) - y}{8} = 6 \qquad \textbf{M1}$ $6y + 12 - y = 48 \qquad \textbf{M1}$ $5y = 48 - 12$ $5y = 36$ |

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| 2a) | $T_{12}: 70 = a + (12 - 1)d$ | |
| | 70 = a + 11d (1) M1 | |
| | 70 - a+11d (1) W1 | |
| | $T_6: 34 = a + (6-1)d$ | |
| | 34 = a + 5d (2) M1 | |
| | 01 = 01 00 (2) WI | |
| | (1) $-$ (2): $70 = a+11d$ | |
| | 34 = a + 5d M1 | |
| | 36=6d | 6 |
| | d=6 A1 | |
| | | |
| | d = 6 into (2): 34 = a + 5d | |
| | 34 = a + 5(6) M1 | |
| | a = 4 A1 | |
| | | |
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| | | |
| 2b) | The cleaning cost of the first floor: | |
| | | |
| | d = 50, $a = 150 - 50$ | |
| | a = RM100 B1 | |
| | | |
| | The cleaning cost of the whole building: | |
| | | 4 |
| | $S_{n} = \frac{n}{2} [2a + (n-1)d]$ | 4 |
| | _ | |
| | $S_{30} = \frac{30}{2} [2(100) + (30 - 1)(50)] $ M2 | |
| | $S_{30} = RM24,750$ A1 | |
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| 2c) | $T_{n} = ar^{n-1}$ $-\frac{40}{6561} = (-40)\left(\frac{1}{3}\right)^{n-1} M1$ $\frac{1}{6561} = \left(\frac{1}{3}\right)^{n-1}$ $log\left(\frac{1}{6561}\right) = (n-1)log\left(\frac{1}{3}\right) M1$ $\frac{log\left(\frac{1}{6561}\right)}{log\left(\frac{1}{3}\right)} = n-1 M1$ $8 = n-1$ $n = 9 A1$ | 4 |
|--------|--|---|
| 2d i) | $S_{n} = \frac{a(r^{n} - 1)}{r - 1}$ $819 = \frac{a(4^{6} - 1)}{4 - 1}$ $819 = \frac{a(4095)}{3}$ $A1$ $A = \frac{3}{5}$ $A1$ | 4 |
| 2d ii) | $T_n = ar^{n-1}$ $T_{12} = \frac{3}{5}(4)^{12-1}$ M1 $T_{12} = 2516582.4$ A1 | 2 |