**April 2016 PPE Edexcel Style Higher Tier 2H Mark scheme**

|  |  |  |  |
| --- | --- | --- | --- |
| Question (part) | Answer | Mark | Notes |
| 1(a) |  | 1 | B1 plotted correctly at (4, 20) |
| 1(b) | positive | 1 | B1 |
| 1(c ) | 36 | 2 | B2 Use of line of best fit to arrive at answerM1 for a single line segment with positive gradient that could be used as a line of best fit or a vertical line from 22 A1 for given answer in the range 33-38 |
| 2(a) | 0.1075322793 | 2 | M1 for either 45.34…. or 421.67 or correct fraction |
| 2(b) | 0.108 | 1 | B1 – allow ft |
| 3 | 2.5 | 4 | M1 10 ÷ (3+5)M1 for ‘1.25’ ×3M1 6.25-‘3.75’A1 cao |
| 4 | 28.3 | 3 | M1 for *π* × 11 or 2 × π × 5.5 B1 28.27875959A1 28.28 |
| 5 | 63 | 4 | M1 for 150 − 65 (=85) M1 for 68 − 52 (=16) M1 for '85' − 6 − '16' A1 cao  |
| 6 | 5 000 000 | 2 | M1 for 1000 × 1000 isolated or 5 × 1000 × 1000A1 cao |
| 7 | No, not enough fence | 5 | M1 for substituting into Pythagoras’ theorem to find length of diagonal sideM1 for complete correct use of Pythagoras’ theoremM1 for a complete method to find the perimeter of their trapeziumA1 14.(4721…)C1 (dep on correct first 2 M marks) for correct conclusion dependent upon supporting calculations |
| 8 | Large tray, with correct comparison | 4 | M1 for one calculation e.g 6.99 ÷ 30 (= 0.233…) **or** 9.45 ÷ 40 (= 0.23625…) **or** 10.99 ÷ 50 (= 0.2198…) M1 for three calculations ( from above)A1 for 0.233 **and** 0.23625 **and** 0.2198 can be rounded or truncated as long as they remain different C1 (dep on M1) for conclusion ft from three comparable figures [or any other calculations leading to comparable figures]  |
| 9 | Correct perpendicular construction | 2 | M1 for a pair of arcs or a single arc, centre *P*, that cut line *AB* **and** at least one pair of arcs not at *P* within guidelinesA1 for perpendicular within guidelines with appropriate construction arcs |
| 10 | 2.4 | 4 | B2 for a trial 2.1 ≤ *x* ≤ 2.5 evaluated(B1 for a trial 2 ≤ *x* ≤ 3 evaluated)B1 for a different trial 2.3 < *x* ≤ 2.35 evaluatedB1 (dep on at least one previous B1) for 2.4Accept trials correct to the nearest whole number (rounded or truncated) if the value of *x* is to 1 dp but correct to 1dp (rounded or truncated) if the value of *x* is to 2 dp. |
| 11(a) | ±7 | 2 | M1 for intent to divide both sides by 6 as a first step or answer of 7 or -7 A1 ±7  |
| 11(b) | $$w^{6}$$ | 1 | B1 |
| 11( c) | $$15a^{7}c^{5}$$ | 2 | B1 15 or $a^{7} or c^{5}$A1 cao |
| 11(d) | $$a^{12}$$ | 1 | B1 |
| 12(a) | Enlargement, scale factor 4, centre (1,1) | 3 | B1 each part |
| 12(b) | Correct reflection(0,7), (2,7) (2,4) | 2 | B1 any reflectionB2 reflection in line $y=x$ |
| 13(a) | -3,-2,-1,0,1 | 2 | B2 all correctB1 four correct |
| 13(b) | $$x>2.5$$ | 2 | M1 for attempt to collect like terms – either x or numbersA1 2.5 oe |
| 14 | Fixed Rate – with justification | 4 |  M1 for a method to calculate 3% or 1.5% of 15000 M1 for a method to calculate using a compound interest method, eg 1.0252 A1 for 15759.38 or 15681.75 C1 for a correct decision in a statement with two correct comparable values.**NB** all final money values can be rounded or truncated to nearest integer or left unrounded. |
| 15(a) | 18.88 | 4 | M1 for finding *fx* with *x* consistent within intervals (including the end points) allow 1 error; implied by 40,126,…M1 (dep) for use of all correct mid-interval values eg 944M1 (dep on 1st M1) for ∑*fx* ÷ ∑*f* A1 for 18.88 oe  |
| 15(b) | Yes- comparable value and conclusion | 3 | B1 for indication of a reading taken from the table of days where temp less than 16- ie 13 ( 9+3) A1 for value 12.5 ( quarter of 50)C1 (dep on at least M1) for conclusion (justified- comparing 12.5 and 13) |
| 16 | 450 | 4 | M1 for *ABC* = 90 M1 for (*ACB* =) 180 – 90 – 25 (= 65)M1 for (*ADB* =) 180 – ‘65’ – 70 (=45)A1 cao supported by working |
| 17 | 15.3 | 2 | M1 for 9.28 x 1020 ÷ 6.08 x 1019A1 15.3 –accept 15 |
| 18 | $$y=- \frac{1}{2} x$$ | 3 | M1 for recognition that the gradient of **L2** is $-\frac{1}{2}$ M1 for substitution of *x*=-4 and *y*= 2 into *y*= “*m*”*x*+cA1 *y* = $-\frac{1}{2}x$ oe |
| 19(a) | Correct diagram | 2 | M1 for a box drawn with at least 2 correct points from LQ, Median and UQ **or** with maximum value of 280 plottedA1 for a fully correct box plot ( 60,100,160,220,280) |
| 19(b) | Correct comparison | 2 | C1 for a correct comparison of a measure of spread (using either range or IQR) or ft their box plotC1 for a correct comparison of medians (accept averages)For the award of both marks at least one of these comparisons must be in the context of the question. |
| 20(a) | 145 000 | 1 | B1 |
| 20(b) | 2613 | 3 | B1 for 2612 M1 for their ‘145 000’ ÷ their ‘55.5’ |
| 21 | Shown | 3 | M1 for correct expansion of (*n* + 1)2 or (*n* -1)2M1 for correct expansion of complete expression,(*n* 2 $n^{2}+2n+1-( n^{2}+2n+1)$A1 for 4*n* and conclusion |
| 22 | 4 | 2 | M1 for 12÷ 164 × 50A1 4 (accept 3) |
| 23 | -0.468, 2.14 | 3 | M1 for $\frac{--5 \pm √( -5^{2}-\left(4×3×-3\right))}{2×3}$ (condone one sign error)M1 for $\frac{-5 \pm √61}{6}$ A1 |
| 24 | $$\frac{1}{4}$$ | 4 | A1 AB = 2b-2aA1 AP = 3/8 AB or BP = 5/8 BAM1 OP = OA+AP or OB+BP = 2a +3/8( 2b-2a) A1 value of m |
| 25(a) | 9.32 | 4 | M1 for 82 − 32 oeM1(dep) for  or 7.41… or 7.42 seenM1 for ‘7.4...…’ ÷ sin 48A1 for 9.32-9.33 |
| 25(b) | 12.7 | 3 | M1 for (CE2 =) 18 2 + ‘(9.32)’2 − 2 (18) ‘(9.32)’ cos 42 M1(dep) for correct order of evaluation to reach $\sqrt{161.5224482}$A1  |
| 26(i) | (6,-6) | 1 |  |
| 26(ii) | (3,-10) | 1 |  |
| 26(iii) | (-6,-10) | 1 |  |