**MARK SCHEME FOR ADDITIONAL MATHS PAPER 1**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No**  |  | **Mark Scheme** | **Mark** | **Grand Total** |
| 1 | ( a )( b ) |  157 | 11 | 2 |
| 2 |  | 12$$\left|3(-2)-6\right|$$ | 2B1 | 2 |
| 3 |  | $p=14, q=\frac{1}{4}$ ( both )$\frac{p}{4}= \frac{7}{2}$ or $\frac{x}{4}= qx$  $h^{-1}=\frac{x+p}{4}$ | 3B2B1 | 3 |
| 4 |  | $p=-\frac{3}{2}$ , $q=-\frac{4}{3}$ ( both )$$\frac{1}{2}=- \frac{p}{3} and \frac{-q}{2}=\frac{2}{3}$$$$\frac{1}{2}=- \frac{p}{3} or \frac{-q}{2}=\frac{2}{3}$$ | 3B2B1 | 3 |
| 5 | ( a )( b ) | *a* > 0*p* = -2*h* = 4 | 111 | 3 |
| 6 |  | $$-3$$$$3x-9=4x-6$$$$2^{3(x-3)} or 2^{4x} or 2^{6}$$ | 3B2B1 | 3 |
| **No** |  | **Mark Scheme** | **Mark** | **Grand Total** |
| 7 |  | $$q=60p^{2}-5$$$$5+q=60p^{2}$$$$5+q= 15n^{2} or 2p=n$$ | 3B2B1 | 3 |
| 8 |  | $$k=32$$$$k= 2^{5}$$$$log\_{2}k=5$$ | 3B2B1 | 3 |
| 9 |  | *n* = 9$$3n>24$$$$-21+\left( n-1\right)\left( 3 \right)>0$$$$ a= -21 or d=3$$ | 4B3B2B1 | 4 |
| 10 |  | *x* = 8$$x^{2}-8x+16=x^{2}-6x$$$$\frac{x-4}{x}=\frac{x-6}{x-4}$$ | 3B2B1 | 3 |
| 11 | ( a)( b ) |  $a= 5\frac{1}{3}$ $\frac{a\left[1-\left(\frac{1}{4}^{3}\right)\right]}{1-\frac{1}{4}}=7$ or equivalent $7\frac{1}{9}$$$\frac{5\frac{1}{3}}{1-\frac{1}{4}}$$ | 2B12B1 | 4 |
| **No** |  | **Mark Scheme** | **Mark** | **Grand Total** |
| 12 |  | $$q=-1 , p=2 ( both )$$$$5q=-5 and p=\frac{3+5}{4-0}$$$$5q=-5 or p=\frac{3+5}{4-0}$$$$y-2x=px^{2}+5q$$ | 4B3B2B1 | 4 |
| 13 | ( a )( b ) | ( 3 , 8 )*y = 4 x – 4* or equivalent*y – 8 = 4 (x -3 )* Gradient = 4 | 13B2B1 | 4 |
| 14 |  | *x2 + y2 + 2x – 12 y + 32 = 0**y2 – 12 y + 35 = - x2 – 2x + 3*$$\frac{y-7}{x-1} ×\frac{y-5}{x+3}= -1$$ | 3B2B1 | 3 |
| 15 | ( a )( b ) | $$\left(\begin{matrix}-8\\-4\end{matrix}\right)$$8.944 unit or 4 $\sqrt{5}$$$\sqrt{(-8)^{2}+ \sqrt{(-4)^{2}}}$$ | 12B1 | 3 |
| 16 | ( a )( b ) | *k= -5*$3\overline{p}+2\overline{q}=\left(h-hk\right)\overline{p}+4h\overline{q}$ *or 3=*$ \frac{1}{2}-\frac{1}{2}k or 4h=2$*1 : 2* | 2B11 | 3 |
| 17 |  | 28.6313.63 + 152(10)sin ( 85.93°/2) or 102 + 102 -2(10)(10) cos 85.93° or 1.5(10) or 1.5 x $\frac{180°}{3.142}$ | 3B2B1 | 3 |
| 18 | ( a )( b ) | $$1-2t^{2}$$ $8t^{4}-8t^{2}+1$ 2($1-2t^{2})^{2}-1$ | 12B1 | 3 |
| **No** |  | **Mark Scheme** | **Mark** | **Grand Total** |
| 19 |  | a = 8 and b = -3 ( both )$-\frac{a}{4}-b=1$and $\frac{a}{2}-2b=10$$-\frac{a}{4}-b=1$ or$\frac{a}{2}-2b=10$$$\frac{dy}{dx}= -\frac{a}{x^{2}}-b$$ | 4B3B2B1 | 4 |
| 20 |  | 2$\frac{\frac{3}{x}+2}{1+\frac{3}{x}}$ or $ \frac{3}{x}\rightarrow 0$  | 2B1 | 2 |
| 21 |  | 6, 6, 7, 8, 13 or 6, 6, 7, 9, 12 or 6, 6, 7, 10, 116, 6, 7, x, yAnswer shows mod = 6 and median = 7 and *x+y* = 21Answer shows mod = 6 or median = 7 or Σ *x* = 40 | 3B2B1 | 3 |
| 22 | ( a )( b ) | $$v=\frac{4u}{u-4}$$-32 cms -1( 5 – 4 ) (4) – 4 (5) ( 1 ) X 2 ( 5 – 4 )2( u – 4 ) (4) – 4 (u) ( 1 ) ( u – 4 )2 | 13B2B1 | 4 |
| 23 | ( a )( b ) | 0.440.92(0.8)(0.4) + ( 0.6)(0.2) + (0.8)(0.6) | 12B1 | 3 |
| 24 | ( a )( b ) | 23950080012P107 257 60010P10 x 2 | 2B12B1 | 4 |
| 25 | ( a )( b ) | 0.351 – 0.1 – 0.3 – 0.25 0.90.3 + 0.35+ 0.25 or 1 – 0.1 | 2B12B1 | 4 |