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| S4 NAT5 Prelim 2014 Paper 1 Marking Scheme | Marks |
| 1. **Ans: 1**$\frac{3}{4}$
* Equivalent Fraction $\frac{6}{8}$
* Subtract fraction
 | 11 |
| 1. **Ans:** $2x^{3}-3x^{2}-5x+6$

 * $2x^{3}+x^{2}-3x$
* $-4x^{2}-2x+6$
* $Collect like terms$
 | 111 |
| 1. **(a) Ans : (*x* – 5)(*x* + 5)**
* Factorise difference of two squares - (*x* – 5)(*x* + 5)

 **(b) Ans:** $\frac{4}{x-5}$* Substitute answer from part (a) in denominator - $\frac{4(x+5)}{(x-5)(x+5)}$
* Simplify fraction - $\frac{4}{x-5}$
 | 111 |
| 1. **Ans: Proof**
* Know to use Cosine Rule - evidence
* Substitute correctly into formula - *cos*(A) = $\frac{4^{2}+ 5^{2}- 6^{2}}{2 × 4 × 5}$
* Complete proof - cos(A) = $\frac{1}{8}$
 | 111 |
| 1. **Ans: y = sin3x**
* **Y = sin3c**
 | 1 |
| 1. **(a) Ans: A(0, -3)**
* Evaluate y by substituting *x* = 0 into formula - A(0, -3)

 **(b) Ans: B(**$ \frac{-3}{2},0)$ **and C(**$ \frac{1}{2}, 0)$* Set y = 0 and factorise - (2*x* + 3)(2*x* – 1) = 0
* Evaluate roots - x = $\frac{-3}{2}$ and x = $\frac{1}{2}$
* Write down co-ordinates - B($ \frac{-3}{2},0)$ and C($ \frac{1}{2}, 0)$

 **(c) Ans:** $ -4$* Find midpoint of roots and substitute into formula - $y=4(\frac{-1}{2})^{2}+4\left(\frac{-1}{2}\right)-3$
* Evaluate - $-4$
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| 1. **(a) Ans: D(5,5,12)**
* **Coordinates of D(5,5,12)**

 **(b) Ans:** $\sqrt{194}$* **d – a =** $\begin{matrix}-5\\5\\12\end{matrix}$
* **Calculate the magnitude** $\sqrt{(-5)^{2}+5^{2}+12^{2}}$
 |  1 1 1 |
| 1. **Ans: *h = 2L + t***
* Multiply both sides by 2 - *2L = h – t*
* Add *t* to both sides - *h = 2L + t*
 | 11 |
| 1. **(a) Ans: Appropriate boxplots**
* Boxplots drawn for each set of data (labelled) - inspection
* Consistent, appropriate scale drawn - inspection
* Both boxplots drawn on same diagram - inspection

 **(b) Ans: Timberplan*** Smaller box (middle 50%, SIQR) therefore more consistent
 | 111 1 |
| 1. **(a) Ans: 4**
* Take cube root of 8 - 2
* Square answer - 4

 **(b) Ans:** $\frac{5\sqrt{3}}{3}$* Multiply top and bottom by root 3
* Simplify
 | 1111 |
| 1. **Ans: Inspection of graph**
* Suitable axes drawn - inspection
* Line sloping down from left to right - inspection
* Line crosses the *y* axis below the *x* axis - inspection
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| 1. (a) Ans: a = 6 , b = -32
* a = 6
* b = -32

 (b) Ans: p = +4 or -4* b2 – 4ac = 0
* (-p)2 – (4 x 4 x 1)= 0
* P2 = 16
* P = +4 or -4
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