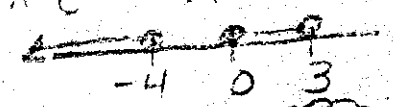


FAMAT Algebra 2 January Regional
Solutions to Individual Test

<p>1. $b^2 - 4ac < 0$ $16 - 4(2)K < 0$ $16 - 8K < 0$ $-8K < -16$ $K > 2$</p> <p style="text-align: right;">C</p>	<p>6. $10x - 5y = 9$ $(-)$ $4x - y = 8$ <hr/> $6x - 4y = 1$ $3x - 2y = \frac{1}{2}$</p> <p style="text-align: right;">A</p>
<p>2. $2x - 3y + 4z = 29$ $-2x + 8y + 4z = -12$ <hr/> $5y + 8z = 17$ $5y + 8z = 17 \rightarrow 30y + 25z = 10$ $6y + 5z = 2 \rightarrow 30y + 48z = 102$ $z = 4, y = 3, x = 2$ $-23z = -92$</p> <p style="text-align: right;">C</p>	<p>7. $16^x = \sqrt[6]{1024}$ $4^{2x} = 4^{5/6}$ $2x = 5/6$ $x = 5/12$</p> <p style="text-align: right;">D</p>
<p>3. $-\frac{2}{3}x + 6 \geq 8$ or $-\frac{2}{3}x + 6 \leq -8$ $-\frac{2}{3}x \geq 2$ $-\frac{2}{3}x \leq -14$ $x \leq -3$ or $x \geq 21$</p> <p style="text-align: right;">C</p>	<p>8. $\log_4(x-2) + \log_4(2x-3) = 2\log_4 x$ $(x-2)(2x-3) = x^2$ $2x^2 - 7x + 6 = x^2$ $x^2 - 7x + 6 = 0$ $(x-6)(x-1) = 0$ $x = 6, 1, x > 2$</p> <p style="text-align: right;">D</p>
<p>4. $\log 72 = \log 2^3 \cdot 3^2$ $= 3\log 2 + 2\log 3$ $= 3a + 2b$</p> <p style="text-align: right;">A</p>	<p>9. $x^2 - 3x + 2 - 6 = 0$ $x^2 - 3x - 4 = 0$ $(x-4)(x+1) = 0$ $x = 4, -1$</p> <p style="text-align: right;">D</p>
<p>5. 3rd term is $10x^3(-3y)^2$ $90x^3y^2$</p> <p style="text-align: right;">D</p>	<p>10. $A \cdot B = \begin{bmatrix} -1 & 2 \\ -1 & 1 \end{bmatrix} \cdot \begin{bmatrix} k-2 \\ 1-1 \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ $-k+2=1$ $k=1$</p> <p style="text-align: right;">B</p>

<p>11. $\log_8 \sqrt{8} = \frac{1}{2}$ $8^{\log_8 5} = 5$ $\log_8 4 + \log_8 2 = 1$ $-3 \log_8 64 = -6$ $6^{\frac{1}{2}} - 6 = \frac{1}{2}$ (A)</p>	<p>16. $x(x^2 + x - 12) \leq 0$ $x(x+4)(x-3) \leq 0$</p>  <p>(D)</p>
<p>12. $f(g(x)) = 2\left(\frac{1}{2}x + 5\right) + k = x$ $x + 10 + k = x$ $k = -10$</p> <p>(A)</p>	<p>17. $2^4(2x+4) = 2^3(3x-4)$ $8x+16 = 9x-12$ $28 = x$</p> <p>(A)</p>
<p>13. $S_n = 18 + 19 + 20 + \dots + 47$ $= \frac{n}{2}(a_1 + a_n)$ $= \frac{30}{2}(18 + 47)$ (D) $= 975$ $975 - 600 = 375$</p>	<p>18. $120,000(.7)^5$ $\\$ 20,168.40$</p> <p>(C)</p>
<p>14. $7x+21 = x^2+6x+9; x \geq 3$ $0 = x^2 - x - 12$ $0 = (x-4)(x+3)$ $x = 4, -3$ (D)</p>	<p>19. $\log_4(x-3)(x+3) = 2$ $\log_4(x^2-9) = 2$ $x^2-9 = 4^2$ $x^2-9 = 16$ $x^2 = 25 \quad x = 5$</p> <p>(D)</p>
<p>15. $y-13+16 = x^2-8x+16$ $y+3 = (x-4)^2$ vertex (4, -3) $y-27+25 = x^2-10x+25$ $y-2 = (x-5)^2$ vertex (5, 2) (C) $y = 5x - 23$</p>	<p>20. $\frac{\text{factors of } 15}{\text{factors of } 6} = \frac{1, 3, 5, 15}{1, 2, 3, 6}$</p> <p>(E)</p>

