

Alg I Team Solutions Feb. Regional 2-11-95

$$\begin{array}{r} 5x-3 \\ 7x-6 \overline{) 35x^2-51x+16} \\ \underline{-35x^2+30x} \\ -21x+16 \\ \underline{+21x+18} \\ 32 \end{array} \quad \begin{array}{r} -1 2 1 1 \\ 2 5 \\ \underline{ 2 5 |} 3 \end{array} \quad \begin{array}{r} 2 0 1 5 \\ \\ \underline{ |} 1 3 \end{array}$$

Sum of remainders $-2+3+133 = \boxed{134}$

$$\textcircled{2} \quad 1 - \frac{4}{a^2} = \frac{a^2-4}{a^2} = \frac{(a-2)(a+2)}{a^2} \cdot \frac{a^2}{(a-2)(a-3)} = \frac{a+2}{a-3}$$

$$1 - \frac{5}{a} + \frac{6}{a^2} = \frac{a^2-5a+6}{a^2} = \frac{(a-2)(a-3)}{a^2}$$

$$\textcircled{3} \quad \begin{array}{l} 4(4x-3y=-1) \rightarrow 16x-12y=-4 \\ 3(9x+4y=-5) \rightarrow 27x+12y=-15 \\ \hline 43x = -19 \end{array}$$

$$x = \frac{-19}{43}, \quad y = \frac{-11}{43}$$

$$x+y = \frac{-30}{43}$$

$$\textcircled{4} \quad \begin{array}{l} \frac{1}{6}M = -4 \quad -14V = -9A \quad -\frac{3}{5}|T| = 0 \quad -\frac{4}{3} = H \\ M = -24 \quad 16 = A \quad T = 0 \quad H = 8/3 \end{array} \quad -24 \cdot 16 \cdot 0 \cdot 8/3 = \boxed{0}$$

$$\textcircled{5} \quad (3x-4)(2x+3) - 3(3x-4) = (4x-3)(3x-5) + 5(4x-3)$$

$$6x^2+x-12-9x+12 = 12x^2-29x+15+20x-15$$

$$6x^2-8x = 12x^2-9x$$

$$0 = 6x^2 - 8x \Rightarrow x(x-6) = 0; \quad \boxed{x=0, x=6}$$

$x = \$$ amount business is worth

$$\frac{1}{2}x + \frac{1}{5}x = 77,000$$

$$\frac{3}{10}x = 77,000$$

$$\boxed{x = \$110,000}$$

$$\textcircled{7} \quad y = \frac{3}{2}x - 6, \quad 5x + 2y = 9, \quad x + 2y - 6 = 0, \quad y = 2$$

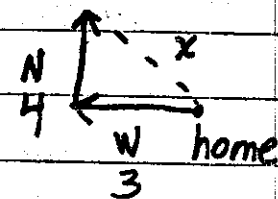
$$m = 3/2 \text{ (a)} \quad m = -5/2 \text{ (b)} \quad m = -1/2 \text{ (c)} \quad m = 0 \text{ (d)}$$

$$\frac{3}{2} + (-\frac{5}{2}) - \frac{-1}{2}(0) = \frac{-2}{2} = \boxed{-1}$$

⑧ $x = 3^{\text{rd}}, 2x = 1^{\text{st}}, 2x - 4 = 2^{\text{nd}}, 2x - 4 + 6 = 4^{\text{th}}$
 $7x - 2 = 82; 7x = 84; x = 12 \therefore \boxed{24, 20, 12, 6}$

⑨ $f(x) = x^2$ & $g(x) = x - 1$ find $f[g[f[g(42)]]]$
 $\frac{1}{2} - 1 = -\frac{1}{2} \Rightarrow \left(-\frac{1}{2}\right)^2 = \frac{1}{4} = \frac{1}{4} - 1 = \left(-\frac{3}{4}\right)^2 = \frac{9}{16}$

⑩ $|-2x+3| < |-2x|+|3|$ b/c $|a+b| \leq |a|+|b|$
 $|-2x+3| = |-2x|+|3|$ when $-2x \geq 0, x \leq 0 \therefore$ we must exclude $x \leq 0$ from solution. Solution would be $\boxed{x > 0}$

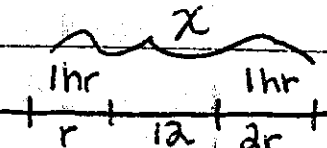
⑪  $3^2 + 4^2 = x^2$
 $\boxed{5 = x}$

⑫ $w^2 + w - 2, w^2 - w - 6, w^2 - 4w + 3$
 $(w+2)(w-1), (w-3)(w+2), (w-3)(w-1)$ LCM
 $(w-3)(w-1)(w+2)$

⑬ $\frac{3^{2x+6}}{3^{2x}} = 3^6 = \boxed{729}$

⑭

	r	t	d
Ann	r	2	2r
Amy	2r	2	4r



$$\begin{aligned} 6r + x &= 66 \\ x - 3r &= 12 \\ \hline 6r + x &= 66 \\ -6r + 2x &= 24 \\ \hline 3x &= 90 \quad (x=30) \end{aligned}$$

⑮ $2b^3 + 1 \overline{) 2b^5 - 8b^4 + 2b^3 + b^2}$
 $\underline{-2b^5 + 0b^4 + 0b^3 + b^2}$
 $-8b^4 + 2b^3$
 $\underline{+8b^4 + 0b^3 + 0b^2 + 4b}$
 $2b^3 + 0b^2 + 4b$
 $\underline{-2b^3 + 0b^2 + 0b - 1}$
 $\boxed{4b - 1}$

ans: $b^2 - 4b + 1 + \frac{4b - 1}{2b^3 + 1}$