Algebra I Individual Test Solutions - March Regional

3/11/95

C 29.
$$\frac{(2x-1)(x+3)}{2x^2+5x-3} \cdot \frac{(x+2)(x-2)}{x^2-4}$$
$$\frac{x^2-5x+6}{(x-2)(x-3)} \quad \frac{x^2+5x+6}{(x+3)(x+2)}$$
$$\frac{2x-1}{x-3}$$

C 30.
$$x-3 \overline{)3x^3-9x^2+Kx-12}$$
$$3x^2+4$$
$$-3x^3+9x^2$$
$$Kx-12$$
$$-4x+12$$
$$K=4$$

Team Solutions

(-29/7) 1. Must have same slope
$m = \frac{11}{-7}$ $\quad \frac{11}{-7} = \frac{n-5}{5}$
$55 = -7n+35$
$20 = -7n$
$\frac{-20}{7} = n$

(5) 2. $x^9-x = x(x^8-1)$
$= x(x^4+1)(x^4-1)$
$= x(x^4+1)(x^2+1)(x^2-1)$
$= x(x^4+1)(x^2+1)(x+1)(x-1)$
5 factors

(0) 3. $(x^3-3x^2-3x+1) \div (x-2)$
Remainder is: -9
$(2x^3+6x^2+6x+2) \div (x-4)$
Remainder is: 250
$(x^3-3x^2-3x+1) \div (x+1)$
Remainder is: 0
$(2x^3+6x^2+6x+2) \div (x-2)$
Remainder is: 54

3. continued
Product is: $(-9)(250)(0)(54)$
$= 0$

(-5±√21/2) 4. $\left(\frac{5}{x} + \frac{x}{x+3} = \frac{14}{x^2+3x}\right)^{x^2+3x}$
$5x+15+x^2 = 14$
$x^2+5x+1 = 0$
$x = \frac{-5 \pm \sqrt{25-4}}{2}$
$= \frac{-5 \pm \sqrt{21}}{2}$

(-2) 5. $|2x+5| \le 10$
$2x+5 \le 10$ AND $2x+5 \ge -10$
$2x \le 5$ $\quad 2x \ge -15$
$x \le 5/2$ AND $x \ge -\frac{15}{2}$
Integers in solution are
$\{-7,-6,-5,-4,-3,-2,-1,0,1,2\}$
Sum is -25

(40) 6. x = what she is paid back
$\frac{2}{3}x = \frac{3}{4}(85-x)$
$x = 45$
She owes $85-45$ or \$40

(-3a+b or b-3a) 7. $xb-a(x-4b) = 3a^2+b^2$
$xb-ax+4ab = 3a^2+b^2$
$\frac{x(b-a)}{(b-a)} = \frac{3a^2+b^2-4ab}{(b-a)}$
$x = \frac{3a^2-4ab+b^2}{b-a}$
$= \frac{(3a-b)(a-b)}{b-a}$ $\quad -1$
$= -3a+b$ or $b-3a$

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(4/5)

8. $\frac{\text{primes}}{\text{composites}} = \frac{2,3,5,7,11,13,17,19}{4,6,8,9,10,12,14,15,16,18}$

$\frac{8}{10}$ or $\frac{4}{5}$

(2)

9. $-3x+7 \geq -8+2x$

$-5x \geq -15$

$x \leq 3$

$-y-3 > 1-5y$

$4y > 4$

$y > 1$

$|2z-3| = 1$

$2z-3 = 1$ OR $2z-3 = -1$

$2z = 4$ $\quad 2z = 2$

$z = 2$ $\quad z = 1$

Common # is 2.

(3/2 or 1 1/2)

10. $5y-8(2y-1) = 41$

$5y-16y+8 = 41$

$-11y = 33$

$y = -3$

solution for other equation is -2.

$3(-2)-8A+4 = -14$

$-8A-2 = -14$

$-8A = -12$ $\quad A = 3/2$

(1/3)

11. $\frac{1}{x}+\frac{1}{y} = \frac{x+y}{xy}$

$= \frac{10}{30}$ or $\frac{1}{3}$

12. $\dfrac{\frac{4}{x}-\frac{1}{3}}{\frac{16}{x^2}-\frac{1}{9}} = \dfrac{\frac{12-x}{3x}}{\frac{144-x^2}{9x^2}}$

(3x/(12+x))

$\frac{12-x}{3x} \cdot \frac{9x^2}{144-x^2} = \frac{3x}{12+x}$

13. $\dfrac{\frac{1}{y^2}-\frac{1}{x^2}}{\frac{2}{y}+\frac{2}{x}} = \dfrac{\frac{x^2-y^2}{x^2y^2}}{\frac{2x+2y}{xy}}$

((x-y)/(2xy))

$\frac{x-y}{x^2y^2} \cdot \frac{xy}{2x+2y} = \frac{x-y}{2xy}$

(-1/2)

14. Let $r = \frac{1}{x}$, $t = \frac{1}{y}$

$+2\{(2r+t=3)$

$(3r-2t=8$

$+4r+2t=+6$

$+7r = 14$

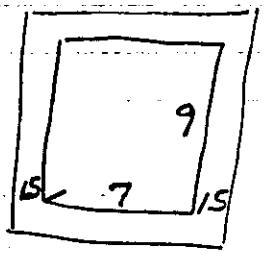
$r = 2$ $\quad x = \frac{1}{2}$

$t = -1$ $\quad y = -1$

$x \cdot y = -\frac{1}{2}$

(19/40)

15.



area of page = 120

area of written page = 63

area of margin is 120-63 or 57

$\frac{57}{120} = \frac{19}{40}$