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Jan. Regional Alge 2 Written Solutions

(P1)

$$\textcircled{1} \quad 6 - 2(9 - 5 + 3) + 192 \div 16 \div 4$$

$$\begin{array}{r} 6 - 14 + 3 \\ -8 + 3 \\ -5 \end{array}$$

$$\textcircled{2} \quad g(f(f(g(2)))) - f(g(g(f(2))))$$

$$\begin{array}{r} -2 \\ -10 \\ 12 \end{array} \quad - \quad \begin{array}{r} 4 \\ 2 \\ 6 \end{array}$$

(6)

$$\textcircled{3} \quad \frac{\text{sum}}{n} = \frac{\cancel{X} \text{ sum}}{\frac{100}{25}}$$

$$\frac{\text{sum}}{n} = \frac{\text{sum}}{25}$$

$\therefore n = 25$

$$\textcircled{4} \quad |x| = -x \quad [x] < x \quad \sqrt{x} = \sqrt{\frac{1}{x}}$$

$$|-4| = 4 \quad [1.3] < 1.3 \quad \sqrt{\frac{1}{3}} = \frac{1}{\sqrt{3}}$$

true true true

(D) all 3 are true

$$\textcircled{5} \quad y = kx \quad y = 6x$$

$$3 = k \cdot \frac{1}{2} \quad y = 6 \cdot 2$$

$$6 = k \quad y = 12$$

$$\textcircled{6} \quad \frac{1 \cdot (2+3i)}{(2-3i)(2+3i)} = \frac{2+3i}{13}$$

$$\begin{array}{r} 4 - 9i^2 \\ 4 + 9 \\ 13 \end{array}$$

$$\textcircled{7} \quad \begin{array}{r} 2^2 - 2 \cdot 3 + 3 \cdot 3^2 \\ 4 - 6 + 27 \\ -2 + 27 \\ 25 \end{array} \quad \begin{array}{r} 25^2 - 25 \cdot 4 + 3 \cdot 4^2 \\ 625 - 100 + 48 \\ 525 + 48 \\ 573 \end{array}$$

$$\textcircled{8} \quad 45t + 80t = 600$$

$$125t = 600$$

$$t = 4 \frac{4}{5} \text{ hr}$$

$t = 4 \text{ hr } 48 \text{ min}$

$$\textcircled{9} \quad h = vt + \frac{1}{2}gt^2$$

$$h - vt = \frac{1}{2}gt^2$$

$$\frac{2(h - vt)}{t^2} = g$$

$$\frac{2h - 2vt}{t^2} = \frac{2h - 2v}{t} = g$$

$$\textcircled{10} \quad \begin{array}{r} 4 - 2x \\ 1 - n - n + 3 \\ (1 - n) - (n - 3) \end{array} \quad \begin{array}{r} n + 5 \\ 2n + 2 - n + 3 \\ (2n + 2) - (n - 3) \end{array}$$

x y

$\frac{4 - 2x}{x} = \frac{n + 5}{y}$

$$\textcircled{11} \quad \begin{array}{r} 86 \\ 81 \\ 90 \\ x \\ \hline 257 + x \end{array} \quad \frac{257 + x}{4} = 87$$

$$257 + x = 348$$

$x = 91$

# dimes	# nickels	# pennies	Value
1	1	11	26^4
2	1	1	26^4
1	2	6	26^4
1	3	1	26^4

4 combinations

$$\textcircled{13} \quad 2[3t - 15 - 3(2t + 2)] = 8(4t - 3) - 5t - 3$$

$$\begin{array}{r} 6t - 6 \\ -6t - 42 \\ -48 \end{array} \quad \begin{array}{r} 32t - 24 \\ -5t - 3 \\ 27t - 27 \end{array}$$

$$\frac{-15}{33} = \frac{33t}{33}$$

$t = -5$

$$\textcircled{14} \quad 5 - 2|4 - 3x| > -\frac{3}{5}$$

$$\frac{-2|4 - 3x|}{-2} > \frac{-8}{-2}$$

$$|4 - 3x| < 4$$

$$4 - 3x < 4 \quad \text{and} \quad 4 - 3x > -4$$

$$-3x < 0 \quad \text{and} \quad -3x > -8$$

$$x > 0 \quad \text{and} \quad x < \frac{8}{3}$$

$0 < x < \frac{8}{3}$

Jan 6 Regional Alg 2 written solutions Con't

(15) Comm. only
because $k \Delta t = -k$
and $t \Delta k = -k$

(16) $\frac{1}{4}(t+1) + \frac{2}{7}t = 1$
 $7t+7+8t=28$

$\frac{15t}{15} = \frac{21}{15} = \frac{7}{5}$ 1 hr 24 min

(17) $(2+i)(2+i)(2+i) = (i^2)^{23} i$
 $4+4i+i^2 = -1 \cdot i$
 $(3+4i)(2+i)$
 $6+11i+4i^2$
 $(2+11i)(-i)$
 $-2i+11$ or $11-2i$

(18) $2x+4y=10$ slope of \perp is 2
 $m = -\frac{2}{4}$

$0 = 2 \cdot 3 + b$
 $-6 = b$
 $y = 2x - 6$
 $-2x + y = -6$
 $2x - y = 6$

(19) x^2 x^2
 $(x+2)^2$ x^2+4x+4
 $(x+4)^2$ $x^2+8x+16$
 $3x^2+12x+20 = 2036$
 $3x^2+12x-2016=0$
 $3(x^2+4x-672)=0$
 $24 \cdot 28$
 $3(x+28)(x-24)=0$
 $24+26+28 = 78$

(20) b^2-4ac
 $36-4 \cdot 1 \cdot 7$
 $36-28$
 8
2 real irrational roots.

(21) 5th term
 $8 \cdot 7 \cdot 6 \cdot 5 (2x)^4 y^4$
 $1 \cdot 2 \cdot 3 \cdot 4$
 $70(16x^4)y^4$
 $1120x^4y^4$

(22) $(\frac{1}{a} + \frac{1}{b^2}) \div \frac{1}{a^5 b^2}$
 $\frac{b^2+a}{a^2 b^2} \cdot \frac{a^5 b^2}{1}$
 $a^5(b^2+a)$
 $a^5 b^2 + a^6$

(23) $180-x = 3(90-x) - 10$
 $180-x = 270-3x-10$
 $180-x = 260-3x$
 $+3x -180$
 $2x = 80$
 $x = 40$
 $180-x = 140$
 $90-x = 50$
190

(24) $\frac{1}{8} \cdot 5 + \frac{1}{x} \cdot 5 = 1$
 $5x + 40 = 8x$
 $40 = 3x$
 $\frac{40}{3} = x$
 $13\frac{1}{3}$ hrs = X
13 hrs 20 min = X

(25) $\frac{(i^2)^{47} + 3(i^3)^{10}}{(i^2)^5} = \frac{2}{-1} = -2$

(26) Descartes' rule of signs.
 $x^6 + 4x^5 - 17x^4 - 80x^3 + 4x^2 + 256x + 192 = 0$
2 sign changes 2 pos roots

(27) $100\pi = 213.737$
 $\pi = 2.137$
 $\frac{99\pi}{99} = \frac{211.6}{99} \approx \frac{108}{495}$

(28) $m = \frac{-3-5}{6-2} = -2$
 $b \cdot 5 = -2 \cdot 2 + b$
 $9 = b$
 $mb = -2 \cdot 9 = -18$

(29) $a^2+79=(a+1)^2$
 $a^2+79=a^2+2a+1$
 $78=2a$
 $39=a$
 $39^2 = 1521$

(30) $5+3i \mid \begin{array}{r} -5 \quad -22 \quad 230 \quad -204 \\ 5+3i \quad -9+15i \quad -200-18i \quad 204 \\ \hline 3i \quad -31+15i \quad 30-18i \quad 0 \end{array}$
 $5-3i \mid \begin{array}{r} 3i \quad -31+15i \quad 30-18i \\ 5-3i \quad 25-15i \quad -30+18i \\ \hline 5 \quad -6 \quad 0 \end{array}$
 $(x+6)(x-1) = 0$
 -6 1 Sum = $-3i$