Algebra II Team

Plant City Inv. 1999

1.) 1st Discount: $x - .4x = .6x$

2nd: $.6x - .2(.6x) = .48x$

3rd: $.48x - .25(.48x) = .36x$

$100\% - 36\% = \boxed{64\%}$

2) $\frac{8!6!4!2!}{7!5!3!1!}$ Think: $\frac{8 \cdot 7!}{7!} = 8$

$8 \cdot 6 \cdot 4 \cdot 2 = \boxed{384}$

3) r = rate of plane

w = rate of wind

$x = r + w$

$-(y = r - w)$

$x - y = 2w$

$\boxed{w = \frac{x-y}{2}}$

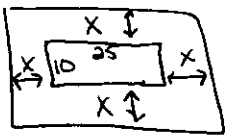
4) A = mode = 6

B = median = 7

C = mean = $\frac{144}{18} = 8$

$\frac{(C-A)^B}{C} = \frac{(8-6)^7}{8} = \frac{2^7}{2^3} = 2^4 = \boxed{16}$

5)



$w = 2x + 10$

$l = 2x + 25$

$A = lw$

$544 = (2x+10)(2x+25)$

$0 = 4x^2 + 70x - 294$

$x = \frac{-70 \pm \sqrt{70^2 - 4(4)(-294)}}{8}$

$x = \frac{-70 \pm 98}{8} = \frac{28}{8} = \boxed{3.5}$

6) $2^1 = 2$, $2^2 = 4$, $2^3 = 8$, $2^4 = 16$, $2^5 = 32$, $2^6 = 64$, $2^7 = 128$, $2^8 = 256$

units digit: 2, 4, 8, 6

$4\overline{)28}$ R 0

Exponents				mult. of 4
1	2	3	4	
5	6	7	8	
9	10	11	12	

28 yes

7) $49.98 = (x - .2x) + .05(x - .2x)$

$49.98 = .8x + .05(.8x)$

$49.98 = .84x$

$\boxed{\$59.50 = x}$

8) 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97

A = Sum: 1060

$B = 4 \cdot 6 \cdot 8 \cdot 9 \cdot 10 = 17280$

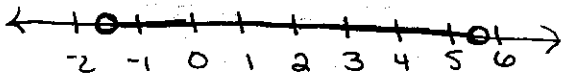
$A - B = 1060 - 17280 = \boxed{-16220}$

9) $|4 - 2x| < 7$

$4 - 2x < 7$ and $4 - 2x > -7$

$-2x < 3$ $\quad -2x > -11$

$x > -3/2$ $\quad x < 11/2$



$2 + 3 + 4 + 5 = \boxed{14}$

10) a, b, c, d, e are all positive integers

$ad = 12$ $\quad ce = 36$

~~+12~~ $\quad$ ~~+36~~

$2 \cdot 6$ $\quad$ ~~2 · 18~~

~~3 · 4~~ $\quad$ ~~3 · 12~~

~~4 · 3~~ $\quad 4 \cdot 9$

~~6 · 2~~ $\quad$ ~~6 · 6~~

~~12 · 1~~ $\quad c < e$

$a < d$

$\boxed{b = 3}$

$2 < ? < 4 < 6 < 9$

11) $A = \{1,2,3,4,5,10,12,14\}$

$B = \{2,4,10,13,14,15\}$

$A \cap B = \{2,4,10,14\}$

$2^4 = 16 - 1 = \boxed{15}$

All subset - $\emptyset$

$2^n - 1$

12) $3x + 2y - 7z = -34$

$3x + 2(-4) - 7(5) = -34$

$3x = 9$

$x = 3$

$y + 5z = 21$

$3y - 2z = -22$

$y = 21 - 5z$

$3(21 - 5z) - 2z = -22$

$y = 21 - 5(5)$

$y = -4$

$63 - 15z - 2z = -22$

$-17z = -85$

$z = 5$

$x + y + z = 3 + -4 + 5 = \boxed{4}$

13) $\left(\frac{(x+1)}{(x+2)}\right)^2 + \frac{(x+1)}{(x+2)} = 12$

$(x+1)^2 + (x+1)(x+2) = 12(x+2)^2$

$x^2 + 2x + 1 + x^2 + 3x + 2 = 12x^2 + 48x + 48$

$2x^2 + 5x + 3 = 12x^2 + 48x + 48$

$0 = 10x^2 + 43x + 45$

$0 = (5x + 9)(2x + 5)$

$\boxed{x = \{-9/5, -5/2\}}$

14) $\frac{1}{\sqrt{x} - \sqrt{y}} \cdot \frac{\sqrt{x} + \sqrt{y}}{\sqrt{x} + \sqrt{y}} = \boxed{\frac{\sqrt{x} + \sqrt{y}}{x - y}}$

15) $.08(30) + 1.00(x) = .10(30 + x)$

$2.4 + x = 3 + .1x$

$.9x = .6$

$x = \frac{.6}{.9} = \boxed{\frac{2}{3} \text{ Cup}}$