Answer Key:

1) C	16) D
2) D	17) B
3) B	18) B
4) D	19) B
5) D	20) C
6) C	21) C
7) D	22) A
8) A	23) E
9) E	24) A
10) B	25) A
11) E	26) C
12) D	27) D
13) B	28) C
14) D	29) B
15) C	30) B

Totals:

A's - 4

B's - 8

C's - 7

D's - 8

E's - 3

Team Answers

1) 6

2) 0

3) 1

4) 4

5) $\frac{1}{2004}$

6) $\frac{10}{17}$

7) $\frac{1}{3}$

8) 28545

9) 2,558

10) 86

11) 4

12) $2\sqrt{5}$

13) 28

14) 134

15) $4\sqrt{3}$

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① $|2x-3| \le 4$

$2x-3 \le 4$ $\quad 2x-3 \ge -4$

$2x \le 7$ $\quad 2x \ge -1$

$x \le \frac{7}{2}$ $\quad x \ge -\frac{1}{2}$

$0+1+2+3 = \boxed{6}$

② $(1+i)(1-i^2)(1-i)(1+i^2)$

$(1+i)(2)(1+i)(0) = \boxed{0}$

③ $\frac{x^{(y-1)(y+1)} \cdot x^{2y+2}}{x^{(y+2)(y-2)} \cdot x^{2y+5}} = \frac{x^{y^2-1+2y+2}}{x^{y^2-y+2y+5}} =$

$\frac{x^{y^2+2y+1}}{x^{y^2+2y+1}} = \boxed{1}$

④

	d	r	t
downstream	4	$x+y$	.75
up	4	$x-y$	1.25

$4 = .75x + .75y$

$4 = 1.25x - 1.25y$

$x = 4.2\overline{6}$ $\quad y = 1.0\overline{6}$

$\frac{x}{y} = \boxed{4}$

⑤ $R = \frac{2006!}{2002!} = 2006 \cdot 2005 \cdot 2004 \cdot 2003$

$U = \frac{2007!}{2004!} = 2007 \cdot 2006 \cdot 2005$

$A = \frac{2007!}{2003!} = 2007 \cdot 2006 \cdot 2005 \cdot 2004$

$N = \frac{2006!}{2002!} = 2006 \cdot 2005 \cdot 2004 \cdot 2003$

$\frac{RU}{AN} = \frac{2006 \cdot 2005 \cdot 2004 \cdot 2003 \cdot 2007 \cdot 2006 \cdot 2005}{2007 \cdot 2006 \cdot 2005 \cdot 2004 \cdot 2006 \cdot 2005 \cdot 2004 \cdot 2003}$

$= \boxed{\frac{1}{2004}}$

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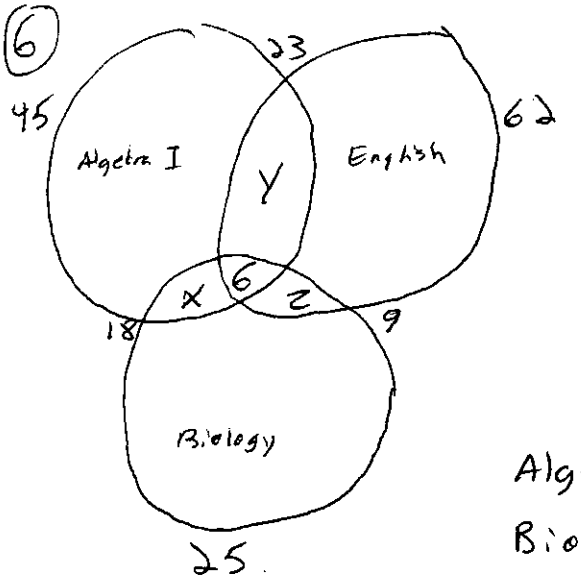
100 total

(6)



$23 = y + 6$

$y = 17$ people taking only Algebra I and English not Biology

$18 = x + 6$

$x = 12$ people taking only Algebra I and Biology not English

$9 = z + 6$

$z = 3$ people taking only English and Biology not Algebra I

Algebra I only $= 45 - 6 - 12 - 17 = 10$

Biology only $= 25 - 6 - 12 - 3 = 4$

English only $= 62 - 6 - 17 - 3 = 36$

$100 = 12 + 17 + 3 + 6 + 10 + 4 + 36 +$ people taking none

12 people taking none

$\frac{AB}{CD} = \frac{12(10)}{17(12)} = \boxed{\frac{10}{17}}$

(7)

A: 9 pattern — 9, 1, 9, 1, ...

B: 8 pattern — 8, 4, 2, 6, 8, 4, 2, 6, ...

C: 7 pattern — 7, 9, 3, 1, 7, 9, 3, 1, ...

D: 6 pattern — 6, 6, 6, ...

$\frac{A+B}{C+D} = \frac{1+4}{9+6} = \frac{5}{15} = \boxed{\frac{1}{3}}$

(9) $\frac{x}{5.5} + \frac{x}{3} + \frac{x}{3.75} = 2$

$\boxed{x \approx 2.558 \text{ hours}}$

(10) $90(15) = 87 + 77 + 99 + 94 + 79 + 75 + 94 + 97 + 87 + 92 + 95 + 99 + 89 + v + j$

$v + j = 186$

max possible grade $= 100$

$v + 100 = 186$

$\boxed{v = 86}$

(8) $15\{17[8(7) - 17] - [8(17) + 7]\} - 15 = \boxed{28545}$

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(11) $d_{steve} = d_{morris}$

$rt = rt$

$7(x+18) = 9x$

$7x+126 = 9x$

$63 = x$

$\sqrt{\frac{(63-7)(2\cdot 63-112)}{(3\cdot 63-182)(63-56)}} = \boxed{4}$

(12) $m = \frac{4.5-1}{-4-3} = -\frac{1}{2}$

$1 = 3(-\frac{1}{2}) + b \quad b = 2.5$

$y = -\frac{1}{2}x + \frac{5}{2}$

line $\perp$ to $\nearrow$ $m = 2$

$4 = 2(7) + b \quad b = -10$

$y = 2x - 10$

Find isect pt.

$y = -\frac{1}{2}x + \frac{5}{2}$

$y = 2x - 10$

$x = 5 \quad y = 0$

Find dist from $(5,0)$ to $(7,4)$

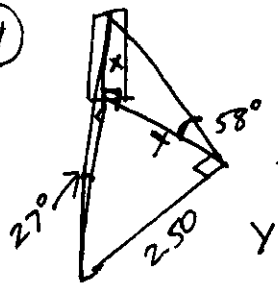
$\sqrt{(7-5)^2+(4-0)^2} = \boxed{2\sqrt{5}}$

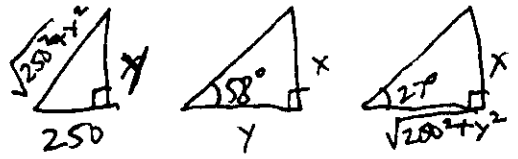
(13) $\pi r^2 h - 4(\frac{1}{3})(\pi r^3)$

$\pi(1.5)^2(12) - \frac{4}{3}(\pi)(1.5)^3$

$= 9\pi \approx \boxed{28 \text{ cu. in.}}$

(14)





$\tan 58 = \frac{x}{y}$ $\quad \tan 27 = \frac{x}{\sqrt{250^2+y^2}}$

$y \tan 58 = x$ $\quad \tan 27 = \frac{y \tan 58}{\sqrt{250^2+y^2}}$

$(\sqrt{250^2+y^2})^2(\tan 27)^2 = (y \tan 58)^2$

$250^2 + y^2 = y^2(9.865)$

$250^2 = 8.865y^2$

$y = 83.966$

$\tan 58 = \frac{x}{83.966} \quad x = 134.37 \approx$

$\boxed{134}$

(15) $\sqrt{(7-3)^2+(8-4)^2+(9-5)^2} =$

$\sqrt{16 \cdot 3} = \boxed{4\sqrt{3}}$