

2009 MC-2 - INDIVIDUAL

① $(0.5)(10)(1) = \boxed{5}$

②
$$\left. \begin{array}{l} x - 8.3 = 8.9 \\ + 8.3 \quad + 8.3 \end{array} \right\} x = 17.2 \Rightarrow \boxed{17}$$

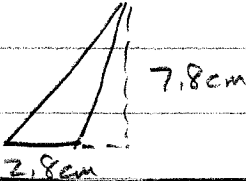
③ Which divisible by 3? $\boxed{7221}$ because sum of digits = 12

④ LCM of 20, 24: $\left. \begin{array}{l} 20 = 2 \times 2 \times 5 \\ 24 = 2 \times 2 \times 2 \times 3 \end{array} \right\} \text{LCM} = 2 \times 2 \times 2 \times 3 \times 5 = \boxed{120}$

⑤ $\frac{5}{16} = \boxed{.3125}$

⑥ $\left. \begin{array}{l} -0.36, -0.\overline{65}, -\frac{8}{15}, \frac{1}{5} \\ -0.36, -0.6565\dots, -0.5333\dots, 0.2 \end{array} \right\} \text{least to greatest} \Rightarrow \boxed{-0.\overline{65}, -\frac{8}{15}, -0.36, \frac{1}{5}}$

⑦ $\frac{209 \text{ km}}{5 \text{ hr}} = \boxed{41.80 \text{ km/hr}}$

⑧  $A = \frac{1}{2}(2.8)(7.8) = \boxed{10.92}$

⑨ 3 solutions to $y = -2x \Rightarrow (-2, 4) (1, -2) (0, 0)$

⑩ 7 blue, 5 yellow, 8 red, 4 green, 6 purple } $P(\sim \text{yellow}) = \frac{25}{30} = \boxed{5/6}$

⑪ $57.5 \div 6.96 \approx 8.2 \Rightarrow \text{so cut out } \boxed{8 \text{ strips}}$

⑫ $229.5 \div 13.5 = \boxed{17}$

⑬ $96 - 76.46 = \boxed{19.54}$

⑭ $5\frac{1}{4} + 2\frac{5}{6} + 8\frac{7}{12} = 5\frac{3}{12} + 2\frac{10}{12} + 8\frac{7}{12} = 15\frac{20}{12} = 16\frac{8}{12} = \boxed{16\frac{2}{3}}$

2009 ML-2 - INDIVIDUAL

15) $\frac{54 \div 6}{21 \div 7} = \frac{9 \cancel{3} \cdot 21}{3 \cdot 21} = \frac{21}{21} = \boxed{3}$

16) $\frac{2}{5}b - 5 = 15 \left\{ \begin{array}{l} +5 \\ +5 \end{array} \right. \Rightarrow \frac{2}{5}b = 20 \cdot \frac{5}{2} \Rightarrow \boxed{b = 50}$

17) $x + \frac{3}{4} = \frac{17}{18} \Rightarrow x = \frac{17}{18} - \frac{3}{4} = \frac{34}{36} - \frac{27}{36} = \boxed{\frac{7}{36}}$

18) $x = \text{original price: } \left(\frac{1}{2}x - 14 \right) - 4 = 31 \Rightarrow \frac{1}{2}x - 18 = 31 \left\{ \begin{array}{l} +18 \\ +18 \end{array} \right. \Rightarrow \frac{1}{2}x = 49$
 $\boxed{x = 98}$

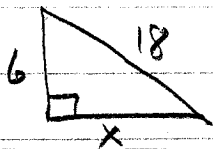
19) 15% of \$130.56 = $(.15)(130.56) = \boxed{\$19.58}$

20) Complementary angle of $30^\circ = 90 - 30 = \boxed{60^\circ}$

21) triangle: $\underbrace{14 + 29}_{43} + x = 180 \Rightarrow x = 180 - 43 = \boxed{137^\circ}$

22) A parallelogram = bh : $A = (95)(9.6) = \boxed{912 \text{ cm}^2}$

23) A trapezoid = $\frac{1}{2}(b_1 + b_2)h$: $A = \frac{1}{2}(13.8 + 16.8)4$
 $= \frac{1}{2}(30.6)4 = \boxed{61.2 \text{ cm}^2}$

24)  $x^2 + 6^2 = 18^2$
 $x^2 + 36 = 324 \rightarrow x^2 = 288$
 $x = \sqrt{288} \approx \boxed{17}$

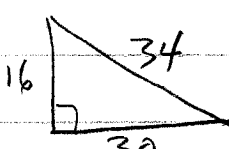
25) $S_{\text{prism}} = 2lw + 2lh + 2wh$
 $= 2(5)(12) + 2(5)(9) + 2(12)(9)$
 $= 120 + 90 + 216 = \boxed{426}$

2009 ML-2 - INDIVIDUAL

(26) $a = -5, b = -2, c = -4$ $(c-b)^2 + a^2$
 $(-4 - (-2))^2 + (-5)^2 = (-2)^2 + (-5)^2 = 4 + 25 = \boxed{29}$

(27) $\frac{1}{6} + \frac{3}{8} + \frac{3}{4} = \frac{4}{24} + \frac{9}{24} + \frac{18}{24} = \frac{31}{24} = \boxed{1\frac{7}{24}}$

(28) $a = 4\frac{1}{5}$ } $a - b + c = 4\frac{1}{5} - 2\frac{7}{20} + 3\frac{1}{4} = 4\frac{4}{20} - 2\frac{7}{20} + 3\frac{5}{20}$
 $b = 2\frac{7}{20}$ } $7\frac{9}{20} - 2\frac{7}{20} = 5\frac{2}{20} = \boxed{5\frac{1}{10}}$
 $c = 3\frac{1}{4}$

(29)  $A = \frac{1}{2}(16)(30) = \boxed{240 \text{ cm}^2}$

(30) numbers 2 to 14 \Rightarrow total of 13 numbers

prime = 2, 3, 5, 7, 11, 13 - 6 numbers

not prime = 4, 6, 8, 9, 10, 12, 14 - 7 numbers

~~Olds~~ against picking prime $\Rightarrow \boxed{7 \text{ to } 6}$

2009 ML-2 TEAM

$$\textcircled{1} \left. \begin{array}{l} Q=9 \quad A=lw=9(6)=54 \\ w=6 \quad P=2l+2w=18+12=30 \end{array} \right\} \frac{A}{P} = \frac{54}{30} = \frac{9}{5} = \boxed{1\frac{4}{5}}$$

$$\textcircled{2} \left. \begin{array}{l} A=3.24 \div 0.15 = 21.6 \\ B=57.5 \times 0.32 = 18.4 \end{array} \right\} A-B = 21.6 - 18.4 = \boxed{3.2}$$

$$\textcircled{3} \left. \begin{array}{l} C = 7.2 + (-9.3) = -2.1 \\ D = 21.3 - 17.43 = 3.87 \end{array} \right\} CD = (-2.1)(3.87) = \boxed{-8.127}$$

$$\textcircled{4} 2, 2, 3, 6, 7, 7, 8, 9, 10, 11, 12 \quad \text{Mean} = \frac{77}{11} = 7$$

\uparrow
 Median

$$\text{Mean} + \text{Median} = 7 + 7 = \boxed{14}$$

$$\textcircled{5} \text{GCF of } 154, 231 \quad \text{LCM of } 42 \text{ and } 91 \quad \text{GCF} = \frac{7 \times 11}{2 \times 3 \times 7 \times 13}$$

$$= \frac{11}{78}$$

Prime factorization for GCF:
 154: $2 \times 7 \times 11$
 231: $3 \times 7 \times 11$
 GCF = 7×11

Prime factorization for LCM:
 42: $2 \times 3 \times 7$
 91: 7×13
 LCM = $2 \times 3 \times 7 \times 13$

$$\textcircled{6} \left. \begin{array}{l} A = 7\frac{3}{4} - 1\frac{5}{6} \\ B = 5\frac{1}{2} + 3\frac{3}{8} \end{array} \right\} B-A = 8\frac{7}{8} - 5\frac{11}{12}$$

$$= \frac{67}{12} - 1\frac{10}{12} = 5\frac{11}{12}$$

$$= 5\frac{11}{12} \quad = 8\frac{7}{8} \quad = \boxed{2\frac{23}{24}}$$

$$\textcircled{7} \left. \begin{array}{l} C = \frac{5}{8} \div 1\frac{9}{16} \\ D = \frac{7}{15} \times 1\frac{3}{4} \end{array} \right\} C \div D = \frac{3}{5} + \frac{49}{60} = \frac{2}{5} \times \frac{60}{49}$$

$$= \frac{5}{8} \div \frac{25}{16} = \frac{5}{8} \times \frac{16}{25} = \frac{2}{5}$$

$$= \frac{7}{15} \times \frac{7}{4} = \frac{49}{60}$$

$$= \boxed{\frac{24}{49}}$$

$$\textcircled{8} \left. \begin{array}{l} E = 7 - (-5) - 8 = 7 + 5 - 8 = 4 \\ F = -1.3 + 7.2 + (-6) = -7.3 + 7.2 = -0.1 \end{array} \right\} EF = (4)(-0.1) = \boxed{-0.4}$$

$$\textcircled{9} \left. \begin{array}{l} G = (0.75)(0.68) = 0.51 \\ H = -5.7 \div (0.19) = 30 \end{array} \right\} \frac{G}{H} = \frac{0.51}{30} = \boxed{0.017}$$

$$\textcircled{10} \left. \begin{array}{l} 2x - 7 = 6 \\ 2x = 13 \\ x = 6.5 \\ \frac{2}{3}y + 1 = -2 \\ \frac{2}{3}y = -3 \\ y = -\frac{9}{2} = -4.5 \end{array} \right\} x + y = 6.5 + (-4.5) = \boxed{2}$$

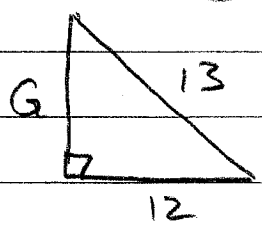
2009 ML-2 TEAM

(11) $\frac{2}{9} = \frac{6}{K}$ $(2, 5) (5, -4)$ $K - S = 27 - 3 = \boxed{30}$
 $m = \frac{-4 - 5}{5 - 2} = \frac{-9}{3}$
 $2K = 54$
 $K = 27$ $S = m = -3$

(12) P% of 5 is 16 Q = 27% of 1500 PQ = (320)(405)
 $\frac{P}{100} = \frac{16}{5}$ = (27)(1500) = $\boxed{129,600}$
SP = 1600 \Rightarrow P = 320 = 405

(13) R = % increase 32 to 36 $\Rightarrow R = \frac{4}{32} = \frac{1}{8}$ } R + S = $\frac{1}{8} + \frac{1}{16}$
S = % decrease 48 to 45 $\Rightarrow S = \frac{3}{48} = \frac{1}{16}$ } = $\frac{2}{16} + \frac{1}{16} = \boxed{\frac{3}{16}}$

(14) Supplementary of $81^\circ = 180 - 81 = 99^\circ$ } $\frac{99}{9} = \boxed{11}$
Complementary of $81^\circ = 90 - 81 = 9$

(15)  $G^2 + 12^2 = 13^2$ H = area = $\frac{1}{2}(5)(12)$
 $G^2 + 144 = 169$ = 30
 $G^2 = 25$
 $G = 5$ $\frac{G}{H} = \frac{5}{30} = \boxed{\frac{1}{6}}$