2008 - Glencoe 2

D ① $7\frac{3}{4} + 1\frac{5}{6} = 7\frac{9}{12} + 1\frac{10}{12} = 8\frac{19}{12} = \boxed{9\frac{7}{12}}$

B ② $8\frac{1}{2} - 3\frac{2}{3} = 8\frac{3}{6} - 3\frac{4}{6} = 7\frac{9}{6} - 3\frac{4}{6} = \boxed{4\frac{5}{6}}$

D ③ $3\frac{1}{5} \times 1\frac{1}{4} = \frac{16}{5} \times \frac{5}{4} = \boxed{4}$

B ④ $2\frac{1}{6} \div 1\frac{1}{3} = \frac{13}{6} \div \frac{4}{3} = \frac{13}{6} \times \frac{3}{4} = \frac{13}{8} = \boxed{1\frac{5}{8}}$

---

⑤ What is the percent increase from 375 to 400

B $\%\text{ change} = \frac{400-375}{375} = \frac{25}{375} = .0666\overline{6} = 6.6\overline{6}\% = \boxed{6\frac{2}{3}\%}$

A ⑥ Write $3\frac{7}{12}$ as a decimal: $3\frac{7}{12} = \boxed{3.58\overline{3}}$

---

⑦ What is the slope of a line $\perp$ to (1, 9) and (−6, −7)

A $\text{slope} = \frac{-7-9}{-6-1} = \frac{-16}{-7} = \frac{16}{7}$ slope of $\perp$ line $= \boxed{-\frac{7}{16}}$

---

⑧ Five less than four times a number (x) is nine more than twice the number

C $4x - 5 = 2x + 9$

$-2x + 5 \quad -2x + 5$

$2x = 14$ → $x = 7$

---

⑨ 3 different scout troops have 12, 24, and 18 members. To march in a parade with same number of columns, we need to find GCF of 12, 24, 18 which is 6 columns.

B

2008 - Glencoe 2

D (10) Total distance $= 2 + 1\frac{1}{2} + 1 + \underbrace{1\frac{3}{5} + 1\frac{2}{5}}_{2} = \boxed{6\frac{1}{2} \text{ miles}}$

C (11) 13% of $596 = .13 \times 596 = \boxed{77.48}$

D (12) $(9.5 \times 10^{-20})(7.5 \times 10^{17}) = 71.25 \times 10^{-3}$
in scientific notation $= \boxed{7.125 \times 10^{-2}}$

---

(13) number increased by 34, multiplied by 5, added to 2, then divided by 4 is 53.

A $$\frac{5(n+34)+2}{4} = 53 \Rightarrow 5n + 170 + 2 = 212$$
$$-172 \qquad -172$$
$$5n = 40$$
$$\boxed{n = 8}$$

---

(14) Find the diameter of a circle with $C = 52.7$

A $C = \pi d$
$52.7 = 3.14d$
$d = 16.78$ → $\boxed{d \approx 16.8 \text{ mm}}$

D (15) $P(\text{miss}) = \frac{1}{3} \longrightarrow P(\text{hit}) = \frac{2}{3}$
What is P(2 out of 3 misses)? $\frac{1}{3} \times \frac{1}{3} \times \frac{2}{3} = \boxed{\frac{2}{9}}$

B (16) 1.8% need replacement in 3 yrs
72 replaced

1.8% of $x = 72$
$.018x = 72$
$x = 72/.018 = \boxed{4000}$

C (17) 480 students
n = number on Student Council
$5n$ = number not on Student Council

$n + 5n = 480$
$6n = 480 \Rightarrow n = 80$
number not on Student Council $= 5(80) = \boxed{400}$

2008 - Glenroe 2

B (18) $(9\times6^2 - 9\times2^2) \div (4+5)$

$(9\times36 - 9\times4) \div 9$

$\frac{9(36-4)}{9} = 36-4 = \boxed{32}$

OR $(9\times36 - 9\times4) \div 9$

$(324-36) \div 9$

$288 \div 9 = 32$

D (19) ${}_{10}P_2 + {}_4P_3 = 10\times9 + 4\times3\times2 = 90 + 24 = \boxed{114}$

A (20) ${}_8C_4 + {}_{10}C_2 = \frac{8\times7\times6\times5}{4\times3\times2\times1} + \frac{10\times9}{2\times1} = 70 + 45 = \boxed{115}$

---

(21) Test Scores: 80, 69, 65, 95, 78, 74, 72, 96, 62, 90, 94, 44, 75, 68, 71, 94 $\Rightarrow$ 16 students

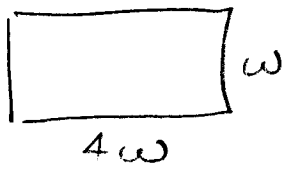
B Sum = 1227 points

Jays score = x $\Rightarrow$ Avg $= \frac{1227+x}{17} = 76$

$1227 + x = 1292$

$x = 1292 - 1227 = \boxed{65}$

C (22)



$P = 50 \Rightarrow 2(w + 4w) = 50$

$2(5w) = 50$

$\boxed{w = 5;\ l = 20}$

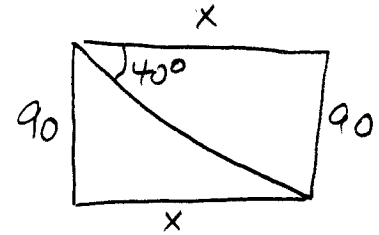
C (23)

$\sqrt{(\sqrt{3}\times\sqrt{12})^2 + (\sqrt{7}+\sqrt{7})^2}$

$\sqrt{(\sqrt{36})^2 + (2\sqrt{7})^2} = \sqrt{36 + 2^2\cdot(\sqrt{7})^2} = 6 + 4\times7$

$= 6 + 28 = \boxed{34}$

B (24)



$\tan 40^\circ = \frac{90}{x} \Rightarrow x = \frac{90}{\tan 40^\circ}$

$= \frac{90}{.8391} \approx \boxed{107.3 \text{ feet}}$

2008 - Glenoe 2

(25) 10 friends at dinner

Bill = $191.10

D Tip = 15% $\Rightarrow$ (.15)(191.10) = 28.665

divided by 10 people $\Rightarrow$ $2.87 each $\approx$ **$2.85**

---

(26) Doug earns 75 + 15% commission in sales

sales = x $\Rightarrow$ $555 = 75 + .15x$

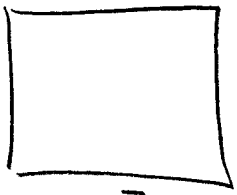
$-75 \quad -75$

$480 = .15x$

A $x = \frac{480}{.15} =$ **$3200**

---

(27) square

D 

3^7 meters

Area $= (3^7)^2 = 3^{14}\ m^2$

$P = 4(3^7)\ m$

---

(28) $6^{2z} = 6^7 \times 6^{z+6}$

C $6^{2z} = 6^{7+z+6}$

$6^{2z} = 6^{z+13}$ so $2z = z + 13$

$z = 13$

---

(29) Square pyramid with Area of base = $9\ ft^2$

slant height = 8 ft

B Square base has sides = 3 ft

$SA = A_{base} + 4(A_{triangle\ side}) = 9 + 4(\frac{1}{2}bh)$

$= 9 + 4(\frac{1}{2})(3)(8) = 9 + 48 =$ **$57\ ft^2$**

---

(30) What % of 125 is 35?

A $\% = \frac{35}{125} = \frac{7}{25} = \frac{28}{100} =$ **28%**

2008 - Glencoe Course 2 - TEAM

① $A+B+C=45$ Calculate $A+B-C$

$A^3-A=C$

$\frac{1}{3}B-A=A \rightarrow \frac{1}{3}B=2A \rightarrow B=6A$

substitution:

$A+\underbrace{6A}_{B}+\underbrace{A^3-A}_{C}=45 \rightarrow A^3+6A=45$

by trial and error, $A=3$

$3^3+6(3)=27+18=4$

$B=6(3)=18$

$C=A^3-A=3^3-3=27-3=24$

$A+B-C=3+18-24=\boxed{-3}$

---

② $D\ ft^2=90\ in^2 \Rightarrow 90\ in^2 \times \frac{1\ ft^2}{144\ in^2}=.625=5/8$

$C\ \frac{lb}{in^2}=16\ \frac{lb}{ft^2} \Rightarrow 16\ \frac{lb}{ft^2} \times \frac{1\ ft^2}{144\ in^2}=.1\overline{1}\ \frac{lb}{in^2}=1/9$

$D-C=\frac{5}{8}-\frac{1}{9}=\frac{45}{72}-\frac{8}{72}=\boxed{\frac{37}{72}}$

---

③+④

2	2 5
3	0 1 4
4	2 7

where $2|2=2.2$

2.2, 2.5, 3.0, 3.1, 3.4, 4.2, 4.7

↑ Q1 ↑ Median ↑ Q3

Range $=4.7-2.2=2.5$

Mean $=23.1/7=3.3$

③ $\frac{(MEAN)(MEDIAN)}{RANGE}=\frac{(3.3)(3.1)}{2.5}=\boxed{4,092}$

④ $(Q1)(Q3)=(2.5)(4.2)=\boxed{10.5}$

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(5)

$A = 7\frac{3}{4} + 1\frac{5}{6} = 7\frac{9}{12} + 1\frac{10}{12} = 8\frac{19}{12} = 9\frac{7}{12} = \frac{115}{12}$

$B = 5\frac{1}{2} - 3\frac{3}{8} = 5\frac{4}{8} - 3\frac{3}{8} = 2\frac{1}{8} = \frac{17}{8}$

$AB = \left(\frac{115}{12}\right)\left(\frac{17}{8}\right) = \frac{1955}{96} = \boxed{20\frac{35}{96}}$

---

(6) $x = 2$

$y = -3$ $\quad C = -\left(\frac{x^2}{y^3}\right)^{-2} = -\left(\frac{y^3}{x^2}\right)^2 = -\left(\frac{y^6}{x^4}\right) = -\left[\frac{(-3)^6}{(2)^4}\right]$

$C = -\frac{729}{16} = -45.5625$

$D = \frac{(x-y)^2}{(x+y)^2} = \frac{(2--3)^2}{(2+-3)^2} = \frac{5^2}{(-1)^2} = \frac{25}{1} = 25$

$C + D = -45.5625 + 25 = \boxed{-20.5625}$

---

(7)

$E = -8-(-6)-5 = -7$

$F = -1.8 + 1.4 + (-2) = -2.4$

$G = (-3.1)(-4.3)(-2.5) = -33.325$

$H = -4.2 \div (-1.4) = 3$

$EF - GH$

$= (-7)(-2.4) - (-33.325)(3)$

$= 16.8 - (-99.975)$

$= \boxed{116.775}$

---

(8) $\left[-\frac{1}{3}\left(x + \frac{7}{2}\right) = 1\right] -3 \Rightarrow x + \frac{7}{2} = -3$

mult. by

$x = -3 - \frac{7}{2} = -6.5$

$\left[\frac{1}{4}(y-4) = 1\right] 4 \Longrightarrow y - 4 = 4 \Rightarrow y = 8$

multiply by

$xy = (-6.5)(8) = \boxed{-52}$

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(9)

K = unit price (cents per ounce) $= \frac{261 \text{ cents}}{15 \text{ oz}} = 17.4$ cents/ounce

h = avg speed $\left(\frac{\text{meters}}{\text{minute}}\right) = \frac{1500 \text{ m}}{250 \text{ sec}} \times \frac{60 \text{ sec}}{1 \text{ min}} = 360 \frac{\text{meters}}{\text{minute}}$

1.5 km = 1500 m

4 min 10 seconds = 250 sec

$KL = (17.4)(360)$

$= \boxed{6264}$

---

(10)

P% of 32 is 12 $\Rightarrow \frac{P}{100} = \frac{12}{32} \Rightarrow P = 37.5$

Q is 27% of 250 $\Rightarrow Q = (.27)(250) = 67.5$

15% of R is 5.4 $\Rightarrow \frac{15}{100} = \frac{5.4}{R} \Rightarrow R = 36$

$P - Q + R = 37.5 - 67.5 + 36 = \boxed{6}$

---

(11) R = % increase 32 to 35 $\Rightarrow R = \frac{35-32}{32} \times 100 = 9.375$

S = % decrease 48 to 45 $\Rightarrow S = \frac{48-45}{48} \times 100 = 6.25$

$R + S = 9.375 + 6.25 = \boxed{15.625}$

---

(12) (7, 2) (−5, 4)

$m = \frac{4-2}{-5-7} = \frac{2}{-12} = -\frac{1}{6}$

Substitute (7, 2): $2 = \left(-\frac{1}{6}\right)(7) + b$

$2 = -6/7 + b \Rightarrow b = 2 + \frac{6}{7} = \frac{20}{7}$

$y = -\frac{1}{6}x + \frac{20}{7}$

$\frac{m}{b} = \frac{-1/6}{20/7} = -\frac{1}{6} \times \frac{7}{20} = \boxed{\frac{-7}{120}}$

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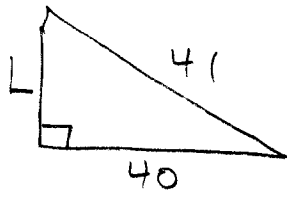
(13) Tree has 18-foot shadow.
5 ft. girl casts 3 ft shadow

$\frac{T}{18} = \frac{5}{3} \Rightarrow T = 30$



$L^2 + 40^2 = 41^2$

$L^2 + 1600 = 1681$

$L^2 = 81 \Rightarrow L = 9$

$\frac{L}{T} = \frac{30}{9} = \boxed{3\frac{1}{3}}$

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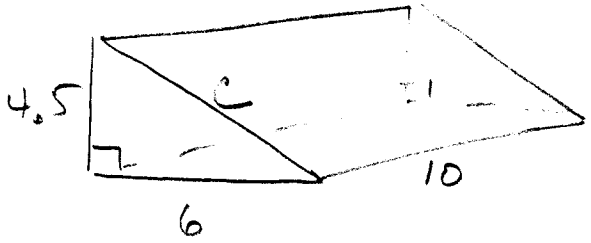
(14)



B = base area $= \frac{1}{2}(4.5)(6) = 13.5$

$c^2 = 4.5^2 + 6^2$

$c^2 = 20.25 + 36 = 56.25$

$c = 7.5$

p = perimeter $= 4.5 + 6 + 7.5 = 18$

$V = Bh = (13.5)(10) = 135$

$SA = 2B + ph = 2(13.5) + (18)(10) = 207$

$SA - V = 207 - 135 = \boxed{72}$

---

(15) Pitcher can throw fastball, curve, or slider.

$M = P(\text{fastball, fastball}) = \frac{1}{3} \times \frac{1}{3} = \frac{1}{9}$

L = ways to rearrange letters of SUCCESS

$$L = \frac{7!}{3!\,2!} = \frac{7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1}{(3 \times 2 \times 1) \times (2 \times 1)} = \frac{5040}{12}$$

$L = 420$

(3! = 3 "S"s, 2! = 2 "C"s)

$\frac{L}{M} = \frac{420}{1/9} = \boxed{3780}$