

Geometry Regional

River Ridge Solutions Jan 1997

Individual Solutions

A (28) $a\triangle ABCD = \frac{1}{2} \cdot 4 \cdot (4+8) = 24$

$a\triangle AED = \frac{1}{2} \cdot 8 \cdot 3 = 12$

area = 36

D (29) $180 - x = 10 + 3(90 - x)$

$180 - x = 10 + 270 - 3x$

$2x = 100$

$x = 50$

$C = 40$

A (30)

Draw a line through C || to \overline{AF} & \overline{BE}

$m\angle GCH = 57$

$m\angle DCH = 37$

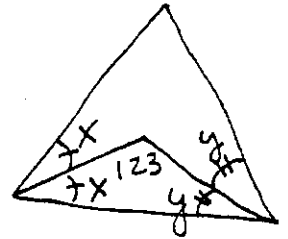
$m\angle GCD = 94$

(2) $p = \left(\frac{5}{3} + \frac{4}{3} + 2\right) \cdot 4 = 10$

(3) $x + y = 57$

$2x + 2y = 114$

$180 - 104 = 66$



(4) $m\angle A = 30$

$m\angle ABC = 60$

$AC = 6\sqrt{3}$

Draw $\overline{DE} \perp \overline{AB}$

which bisects \overline{AB} because $6\sqrt{3}$

$\triangle ADB$ is isos.

$AD = \frac{2}{3}\sqrt{3} \cdot 6 = 4\sqrt{3} = DB$

$(4\sqrt{3})^2 = 48$

(5)

$6 \sin \frac{1}{2} = 3\sqrt{2}$

(20)

$x^2 + 98 = 400$

$x^2 = 302$

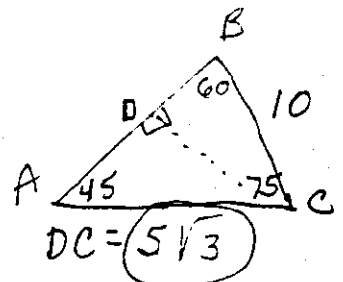
$x = \sqrt{302}$

(6) $3x + 4x + 5x = 180$

$12x = 180$

$x = 15$

Angles are 45, 60, 75



Team Solutions

(1) Diags \perp & bisect each other

A. $x^2 + 400 = 625$

$x = 15$

diag = 30

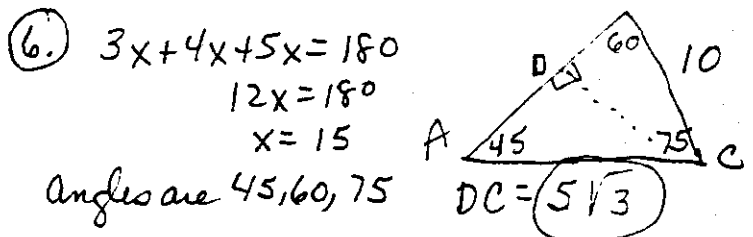
B. $A = \frac{1}{2}d_1d_2 = \frac{1}{2} \cdot 30 \cdot 40 = 600$

C. $A = bh$

$600 = 25h$

$24 = h$

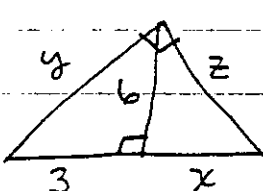
$A + B + C = 30 + 600 + 24 = 654$



Geometry Regional January Team Solutions

⑦ Ratio of sides = $2:\sqrt{3}$
 $27y = 54$ } longest side of
 larger hex
 $y = 2$ } is 12

$\frac{2}{\sqrt{3}} = \frac{12}{x}$ } $x = 6\sqrt{3}$
 longest side
 of smaller

⑧  $6 = \sqrt{3x}$
 $12 = x$
 $9 + 36 = y^2$
 $3\sqrt{3} = y$

$z = \sqrt{12 \cdot 15}$
 $= 6\sqrt{5}$

$6\sqrt{5} + 3\sqrt{3} + 12 = 9\sqrt{5} + 12$

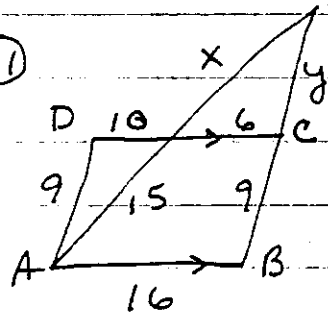
⑨ Use Heron's to find area

$A = \sqrt{16 \cdot 9 \cdot 6 \cdot 1} = 12\sqrt{6}$

$12\sqrt{6} = \frac{1}{2} \cdot 15 \cdot h$

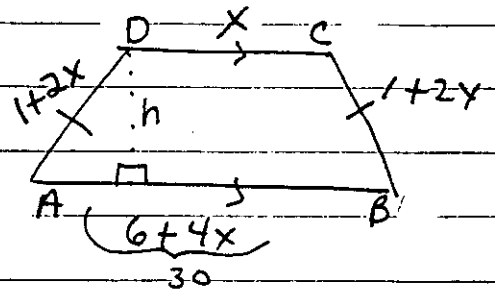
$\frac{8\sqrt{6}}{5} = h$

⑩ $4y - 8 = 3y + 6$ } $5y + 2 = 72$
 $y = 14$ } $9r = 72$ } $r = 8$

⑪  $DC = 16, BC = 9$
 $\frac{x}{x+15} = \frac{6}{16}$; $x = 9$
 $\frac{y}{y+9} = \frac{6}{16}$; $y = \frac{27}{5}$
 $9 + \frac{27}{5} = \frac{72}{5}$ or $14\frac{2}{5}$
 or 14.4

⑫ $A = 360, B = (n-2)180$ or 1260,
 $C = 10$; $360 - \frac{1260}{10} = 78$

⑬ $p = 62$



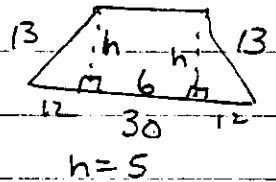
$9x + 8 = 62$

$x = 6, AB = 30, CD = 6$

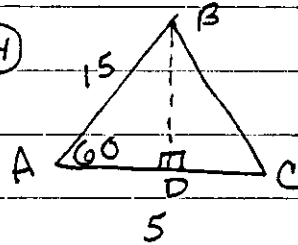
$A = \frac{1}{2}h(b_1 + b_2)$

$= 18 \cdot 5$

$= 90$



⑭



$BD = \frac{15\sqrt{3}}{2}$

$A = \frac{1}{2} \cdot 5 \cdot \frac{15\sqrt{3}}{2}$

$= \frac{75\sqrt{3}}{4}$

⑮ $C = 14\pi$; $\frac{2000 \text{ cm}}{14\pi} = \frac{1000}{7\pi}$