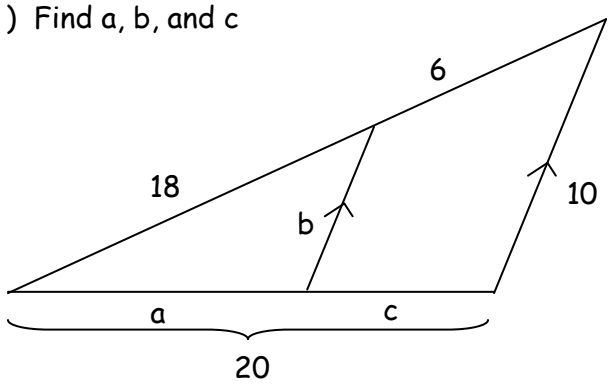
Geometry Honors
Semester 2 Review

Name Key

Chapter 8

1) Find a, b, and c



$\frac{18}{6} = \frac{3}{1} = \frac{a}{20-a}$

$60 - 3a = a$

$60 = 4a$

$15 = a$

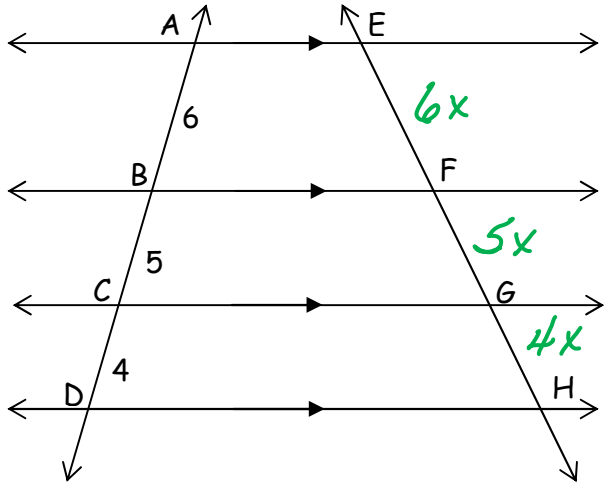
$5 = c$

$\frac{18}{24} = \frac{3}{4} = \frac{b}{10}$

$46 = 30$

$b = 7.5$

2) Find EF, FG and GH if EH = 25



$15x = 25$

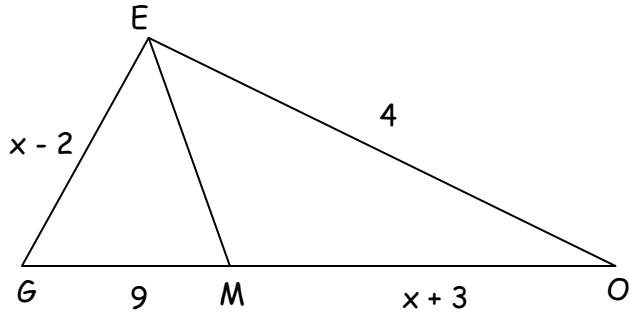
$x = \frac{5}{3}$

$EF = 6\left(\frac{5}{3}\right) = 10$

$FG = 5\left(\frac{5}{3}\right) = 8\frac{1}{3}$

$GH = 4\left(\frac{5}{3}\right) = 6\frac{2}{3}$

3) $\angle GEM \cong \angle MEO$. Find x.



$\frac{x-2}{9} = \frac{4}{x+3}$

$x^2 + x - 6 = 36$

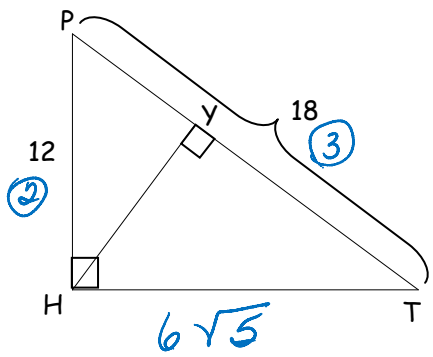
$x^2 + x - 42 = 0$

$(x+7)(x-6) = 0$

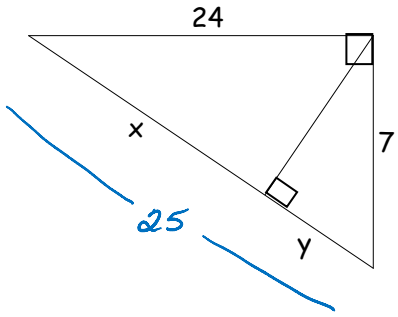
$x = -7, 6$

Chapter 9

1) Find HT. Leave EXACT answer.



2) Find x and y.



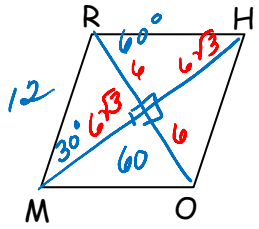
$\frac{25}{7} = \frac{7}{y}$

$25y = 49$

$y = 1\frac{24}{25}$

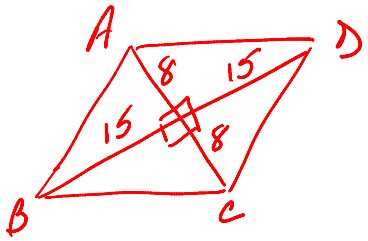
$x = 23\frac{1}{25}$

3) The perimeter of the rhombus RHOM is 48 and $\angle R$ is 120°. Find the sum of the diagonals. (Do NOT use TRIG)



$12 + 12\sqrt{3}$

4) Find the largest interior angle of a rhombus with diagonals 16 and 30.



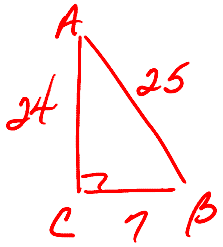
$\tan \angle BAC = \frac{15}{8}$

$\angle BAC = \tan^{-1}\left(\frac{15}{8}\right)$

$\approx 61.93°$

$\angle BAD \approx 123.86°$

5) Find the measures of the three angles in a 7, 24, 25 triangle.



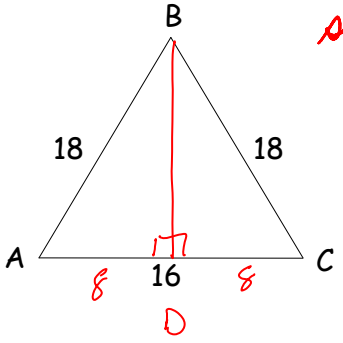
$\sin \angle B = \frac{24}{25}$

$\approx 73.7°$

$\angle A = 90 - \angle B$

$\approx 16.3°$

6) Find the measure of $\angle ABC$.



$\sin \angle ABD = \frac{8}{18}$

$\angle ABD \approx 26.39°$

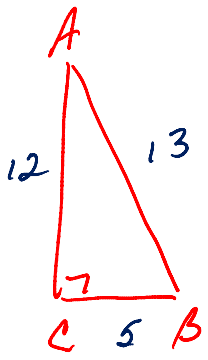
$\angle ABC \approx 52.78°$

7) In $\triangle ABC$, $\sin A = \frac{5}{13}$ and $\angle C$ is a right angle. Find the following:
(Write answers as fractions and draw the triangle.)

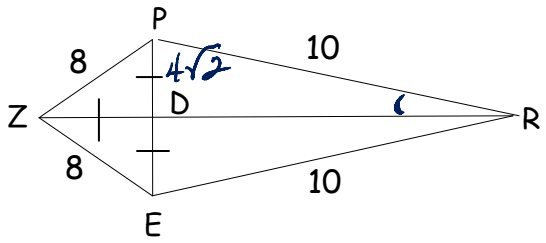
$\sin B = \frac{12}{13}$

$\cos B = \frac{5}{13}$

$\tan B = \frac{12}{5}$



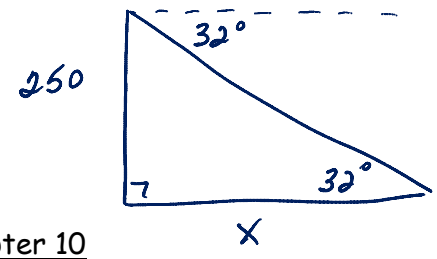
8) Find the measure of $\angle PRD$ to the nearest tenth of a degree for kite PREZ.



$\sin \angle PRD = \frac{4\sqrt{2}}{10}$

$\angle PRD \approx 34.4°$

9) A person is standing on a cliff looking at a tree below. If the cliff is 250 feet high and the person has to look down with a 32° angle of depression to see the bottom of the tree, how far is the tree from the cliff?



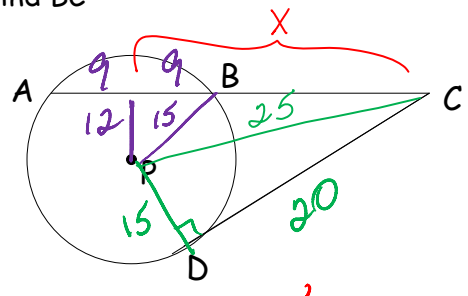
$\tan 32° = \frac{250}{x}$

$x = \frac{250}{\tan 32°}$

$x \approx 400.08$ ft

Chapter 10

1) Given: $\overline{CD}$ is tangent to ⊙P
$\overline{AB}$ is 12 units from the center of ⊙P
AB = 18; CP = 25
Find BC



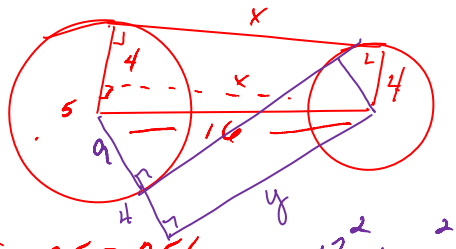
$x^2 + 12^2 = 25^2$

$x^2 = 481$

$x \approx 21.93$

$BC \approx 12.93$

2) Find the common internal and external tangents of circles with centers 16 cm apart and radii 9 and 4.
(Note: This can be done with coordinates too)



$x^2 + 25 = 256$

$x^2 = 231$

$x = \sqrt{231}$

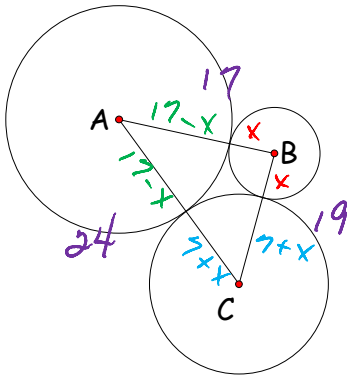
$13^2 + y^2 = 16^2$

$y^2 = 87$

$y = \sqrt{87}$

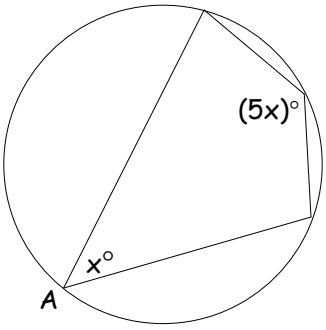
3) Determine the radius of ⊙B. Circles A, B, and C are tangent to each other.

AB = 17
BC = 19
AC = 24



$7+2x=19$
$2x=12$
$x=6$

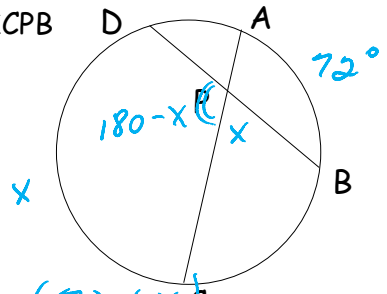
4) In the diagram, find m∠A.



$6x=180$
$x=30°$

5) Given: m $\overset{\frown}{AB}$ = 72°
m $\overset{\frown}{DC}$ = m ∠CPB

Find: m ∠APB

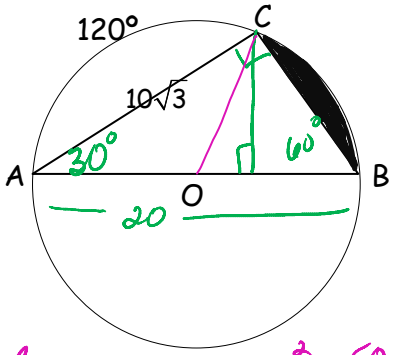


$180-x=\frac{1}{2}(72+x)$
$360-2x=72+x$
$288=3x$
$96=x$
$\angle APB=84°$

6) In ⊙O,
a) find the length of the altitude to $\overline{AB}$, a diameter.

$5\sqrt{3}$

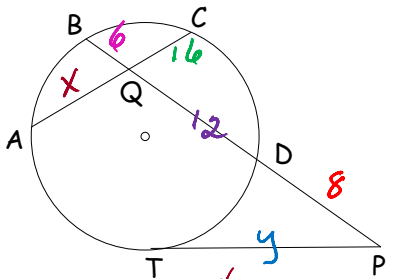
b) find the area of the shaded segment.
(Chapter 11)



$A_{SEC}=\frac{1}{6}\pi\cdot 10^2=\frac{50\pi}{3}$
$A_{\triangle}=\frac{100\sqrt{3}}{4}=25\sqrt{3}$
$A_{SEG}=\frac{50\pi}{3}-25\sqrt{3}$

7) Given: PT is tangent to the circle.
BQ = 6, CQ = 16, DQ = 12, DP = 8

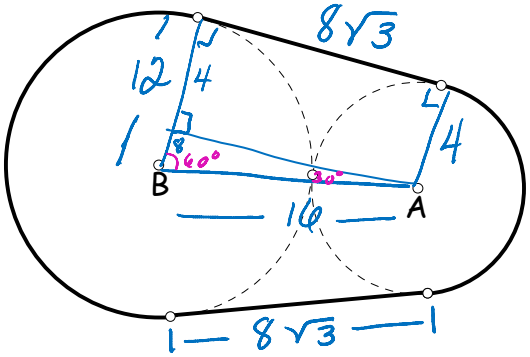
Find: AQ and PT (exact answers)



$6\cdot 12=16x$
$\frac{9}{2}=x$

$y^2=8(26)$
$y^2=4\cdot 2(2\cdot 13)$
$y=4\sqrt{13}$

8) Circles A and B are externally tangent and a belt is wrapped tightly around them. ⊙A has a diameter of 8 and ⊙B has a diameter of 24. Find the exact length of the belt.



⊙B: use $\frac{2}{3}C$

$\frac{2}{3} \cdot 2\pi \cdot 12$

16π

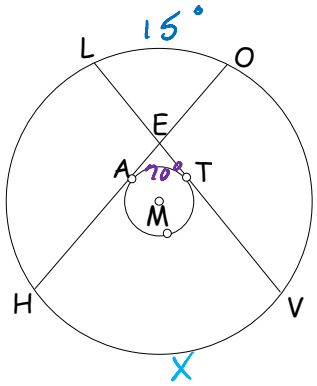
⊙A: use $\frac{1}{3}C$

$\frac{1}{3} \cdot 2\pi \cdot 4$

$\frac{8\pi}{3}$

$\text{Length} = 16\sqrt{3} + \frac{56\pi}{3}$

9) Given: Two circles are concentric with center M
$\overline{LV}$ and $\overline{OH}$ are tangent to smaller circle
$m\overset{\frown}{AT} = 70°$, $m\overset{\frown}{LO} = 15°$.
Find $m\overset{\frown}{HV}$.



$\angle AET = 180 - 70 = 110°$

$110° = \frac{1}{2}(15 + x)$

$220 = 15 + x$

$205° = x$

Chapter 11

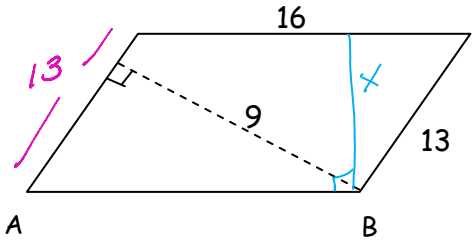
1) Find the area of a triangle with side lengths of 10, 5, and $5\sqrt{3}$.

Right Δ!

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

$= \frac{25\sqrt{3}}{2}$

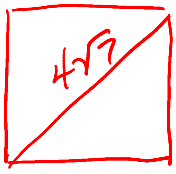
2) In the parallelogram below, find the height to $\overline{AB}$.



$9 \cdot 13 = x \cdot 16$

$x = 7\frac{5}{16}$

3) If a square has a diagonal of $4\sqrt{7}$, find its area.



$A = \frac{1}{2}(4\sqrt{7})^2$

$= 56$

4) The ratio of the diagonals of a kite is 4:5. If the area of the kite is 420, find the longer diagonal.

$\frac{1}{2}(4x \cdot 5x) = 420$

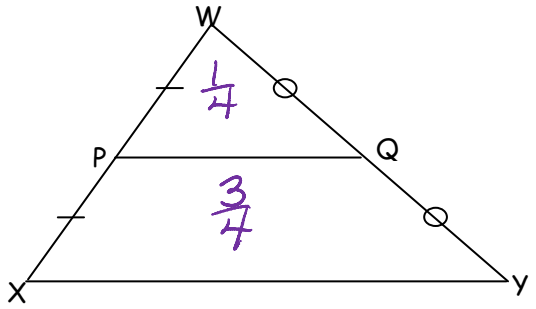
$10x^2 = 420$

$x^2 = 42$

$x = \sqrt{42}$

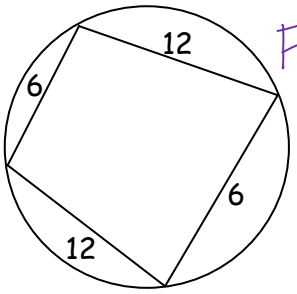
$5x = 5\sqrt{42}$

5) Find the ratio of the areas of ΔWPQ and Trap PQYX



$\frac{1}{3}$

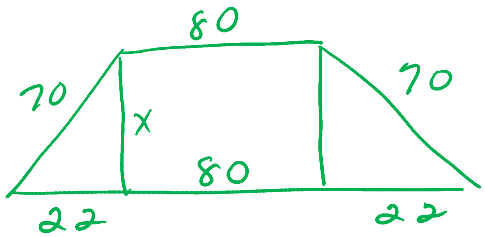
6) Find the EXACT area of the quadrilateral.



Forces to be a RECTANGLE!

$A = 6 \cdot 12 = 72$

7) An isosceles trapezoid has lengths 70, 80, 70, 124. Find the altitude.



$22^2 + x^2 = 70^2$

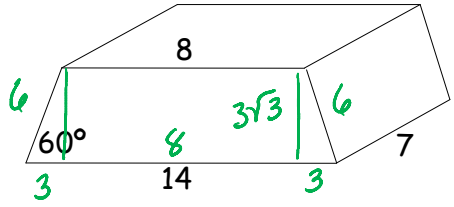
$x^2 = 4416$

$x = 8\sqrt{69}$

Chapter 12

1) Find the **Total Surface Area** and **Volume** for the following solids:

a) Right Isosceles Trapezoidal Prism



$P_{BASE} = 34 \Rightarrow LA = 34 \cdot 7 = 238$

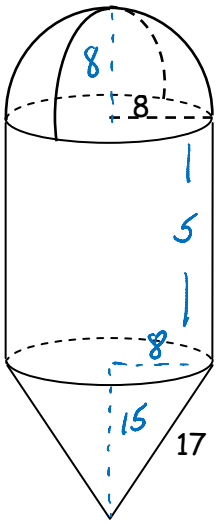
$2B = 2\left(\frac{1}{2}\right)(3\sqrt{3})22 = 66\sqrt{3}$

$SA = 238 + 66\sqrt{3}$

$V = 33\sqrt{3} \cdot 7$

$= 231\sqrt{3}$

b) Hemisphere on a cylinder on a cone.



$SA_{HS} = 2\pi 64 = 128\pi$

$LA_{cyl} = 16\pi \cdot 5 = 80\pi$

$LA_{cone} = \pi \cdot 8 \cdot 17 = 136\pi$

$SA = 344\pi$

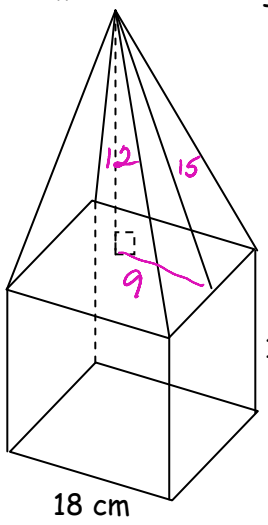
$V_{HS} = \frac{2}{3} \cdot 512\pi = \frac{1024}{3}\pi$

$V_{cyl} = 64\pi \cdot 5 = 320\pi$

$V_{cone} = \frac{1}{3} 64\pi \cdot 15 = 320\pi$

$V = \frac{2944}{3}\pi$

c) Regular square pyramid with a rectangular prism with slant height 15 cm



$LA_{PYR} = \frac{1}{2} \cdot 72 \cdot 15 = 540$

$LA_{PRISM} = 72 \cdot 12 = 864$

$B = 18^2 = 324$

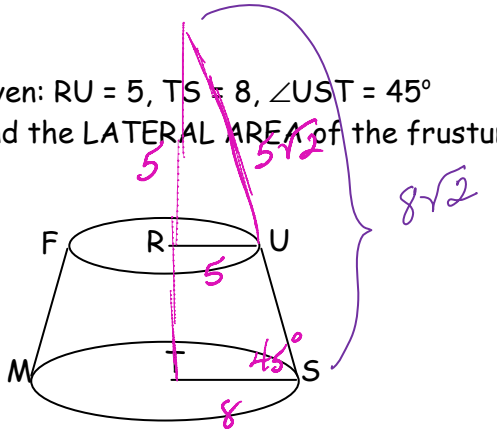
$SA = 1728\ cm^2$

$V_{PYR} = \frac{1}{3} \cdot 324 \cdot 12 = 1296$

$V_{PRISM} = 324 \cdot 12 = 3888$

$V = 5184\ cm^3$

2) Given: RU = 5, TS = 8, $\angle UST = 45°$
Find the LATERAL AREA of the frustum.



$LA_{WC} = \pi \cdot 8 \cdot 8\sqrt{2} = 64\pi\sqrt{2}$

$LA_{TC} = \pi \cdot 5 \cdot 5\sqrt{2} = 25\pi\sqrt{2}$

$LA_{FRUSTUM} = 39\pi\sqrt{2}$

Chapter 13

1) The point (x, 6) is equidistant from the points (3, 8) and (-5, -2). Find the missing coordinate.

$\sqrt{(x-3)^2+(6-8)^2} = \sqrt{(x+5)^2+(6+2)^2}$

$x^2-6x+9+4 = x^2+10x+25+64$

$-76 = 16x$

$x = -4.75$

2) Write the equation of a line that passes through (3, -2) and (7, 1).

$m = \frac{1+2}{7-3} = \frac{3}{4}$

$y+2 = \frac{3}{4}(x-3)$

OR $y-1 = \frac{3}{4}(x-7)$

OR $y = \frac{3}{4}x - \frac{17}{4}$

3) Write the equation of a line in slope-intercept form that has a slope of -2 and passes through the point (-4, 5).

$y-5 = -2(x+4)$

$y = -2x-3$

4) Write an equation of a line that is perpendicular to the line with an equation of $3x + 2y = 6$ and passes through the point (-2, 4).

$m = -\frac{3}{2}$

$y-4 = \frac{2}{3}(x+2)$

OR $y = \frac{2}{3}x + \frac{16}{3}$

5) Write the equation of the circle whose endpoints of a diameter are (-2, 4) and (4, -2).

$M(1, 1)$

$(x-1)^2+(y-1)^2 = r^2$

$(-2-1)^2+(4-1)^2 = r^2$

$9+9 = r^2$

$\boxed{(x-1)^2+(y-1)^2 = 18}$

6) Find the center and radius of the circle: $4x^2 + 4y^2 - 12x + 16y - 48 = 0$.

$x^2+y^2-3x+4y-12 = 0$

$x^2-3x+\frac{9}{4}+y^2+4y+4 = 12+\frac{9}{4}+4$

$(x-\frac{3}{2})^2+(y+2)^2 = \frac{73}{4}$

$C(\frac{3}{2}, -2)$ $\quad r = \frac{\sqrt{73}}{2}$

7) Find the intersection point(s) of the circle $x^2 + (y + 2)^2 = 26$ and the line $-x + y = 4$.

$x^2 + (4 + x + 2)^2 = 26$

$x^2 + (x + 6)^2 = 26$

$x^2 + x^2 + 12x + 36 = 26$

$2x^2 + 12x + 10 = 0$

$2(x^2 + 6x + 5) = 0$

$2(x + 5)(x + 1) = 0$

$y = 4 + x$

$x = -5$ or $x = -1$

$(-5, -1)$ $(-1, 3)$