Math 3a Midterm Geometry Exam Review Worksheet

(1) Find the area of an equilateral triangle if each side is 8.

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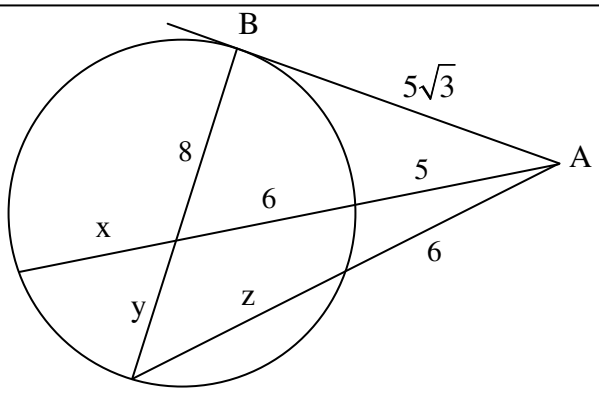
(2) Given the figure to the right, $\overline{AB}$ is tangent at B, sides as marked, find the values of x , y , and z please.



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(3) Find the length of the arc of a sector of 54° in a circle if the radius is 10. Find the area of the sector.

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(4) The apothem of a regular hexagon is $10\sqrt{3}$. Find the length of each side of the hexagon. Find the area of the hexagon.

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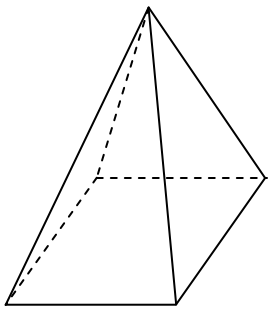
(5) The altitude of a regular pyramid with a square base is 12, and the slant height is 13. Find the volume, LSA and TSA of the pyramid please.



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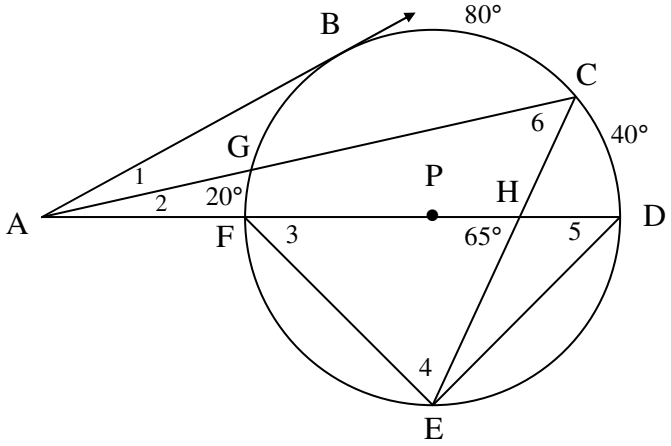
(6) Given the figure to the right,
$\overrightarrow{AB}$ is tangent to the circle at B.
$\overline{FD}$ is a diameter, with measures as marked.
Find:

$m\overset{\frown}{BG}$, $m\overset{\frown}{EF}$, $m\overset{\frown}{DE}$, $m\angle 1$,

$m\angle 2$, $m\angle 3$, $m\angle 4$, $m\angle 5$, $m\angle 6$



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(7) The areas of two similar triangles are 144 and 256. If a side of the smaller triangle is 9, how long is the corresponding side of the larger triangle?

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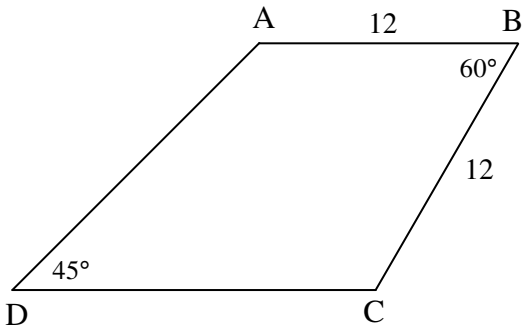
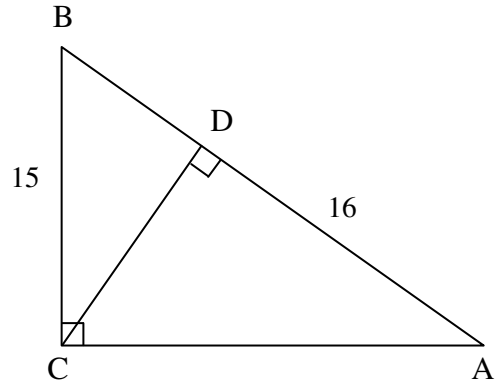
(8) Given the figure below, $\square ABCD$ is a trapezoid with $\overline{AB} \parallel \overline{CD}$ and sides and angles as marked. Find the area and perimeter of $\square ABCD$.

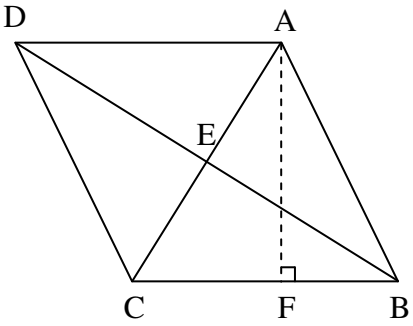


(9) Given the figure below, $\overline{BC} \perp \overline{AC}$, $\overline{CD} \perp \overline{AB}$, and sides as marked. **Find:** CD, BD and the area of $\triangle ABC$



(10) Given the figure to the right, $\square ABCD$ is a rhombus, with $\overline{AF} \perp \overline{BC}$. AC = 10, BD = 24.
Find:

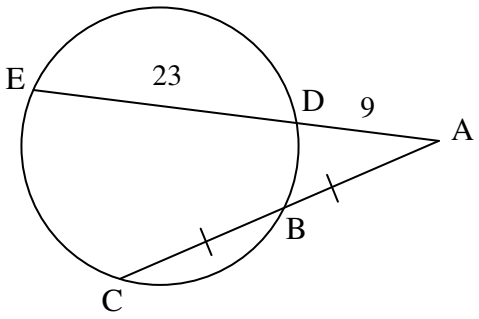
BC, area $\square ABCD$, AF



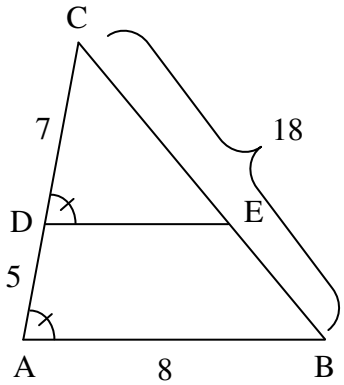
(11) In a circle whose radius is 6, the area of a sector is 15π. Find the measure of the central angle of the sector and the length of the arc of the sector please.

(12) Each side of an equilateral triangle is 12. Find the area of its inscribed and circumscribed circles.

(13) Given the figure below, AD = 9, DE = 23, AB = BC. **Find:** AB



(14) Given the figure below with sides and angles as marked. **Find:** DE and BE



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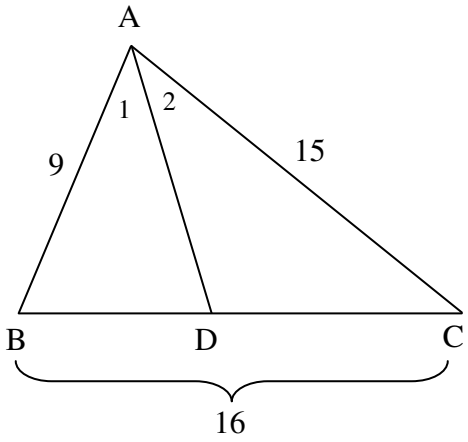
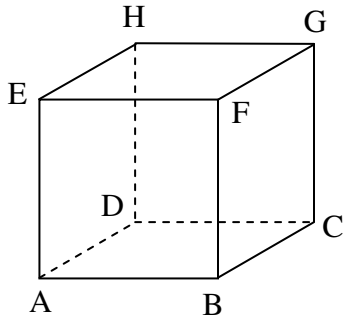
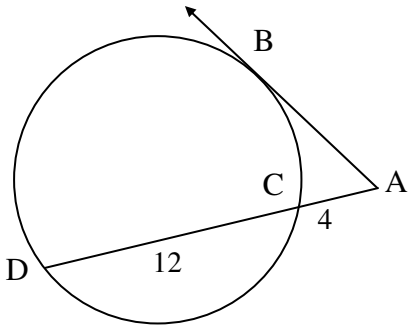
(15) In $\triangle ABC$ below, $m\angle 1 = m\angle 2$, and sides are as marked. **Find:** BD and CD



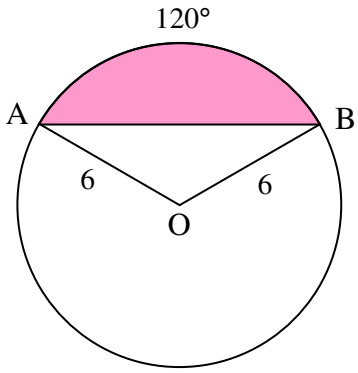
(16) The length of each lateral edge in the cube below is 6. **Find:** the LSA, TSA volume , BD and BH.



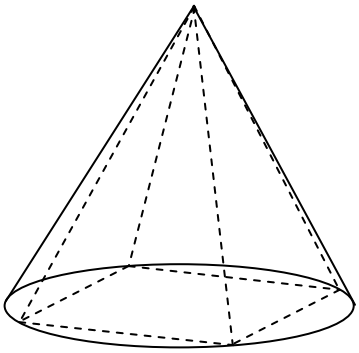
(17) $\overrightarrow{AB}$ is tangent to the circle below. Find AB given sides as marked.



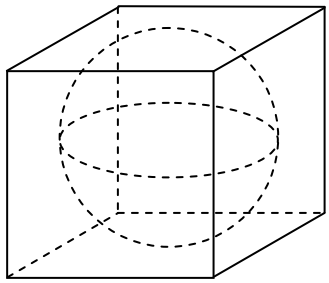
(18) Find the area of the shaded region in the figure below if O is the center of the circle



(19) A square pyramid with base edge 4 is inscribed in a cone with height 6. Find the volume of the pyramid and cone.



(20) Find the volume of a sphere inscribed in a cube if each side of the cube is 6.



(21) The area of an equilateral triangle is $25\sqrt{3}$. Find the length of its sides and altitudes please.

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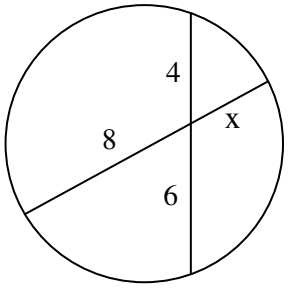
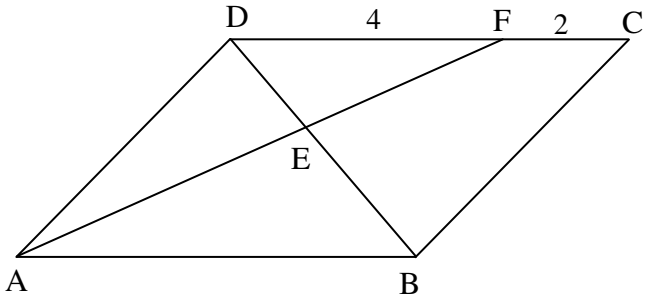
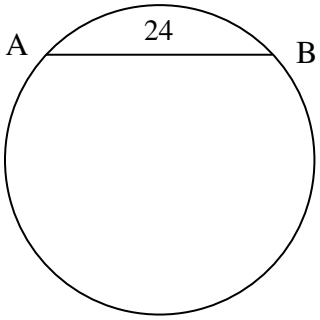
(22) Solve for x in the circle below, given sides as marked.



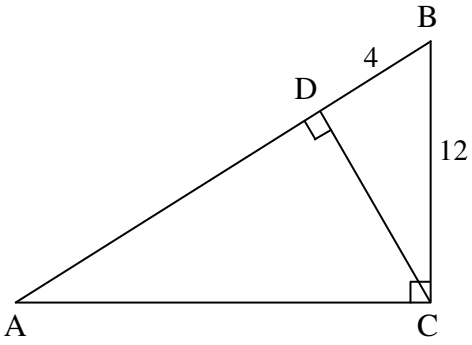
(23) □ABCD is a parallelogram, BD = 5 , DF = 4 , CF = 2.
Find: DE and BE



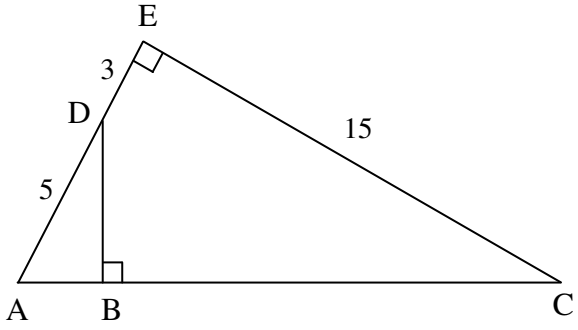
(24) The radius of the circle below is 20. The length of $\overline{AB}$ is 24. How far is $\overline{AB}$ from the center of the circle?



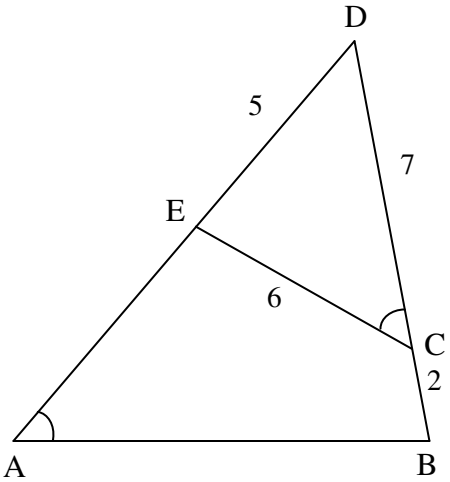
(25) In the figure below, $\overline{AC} \perp \overline{BC}$, $\overline{CD} \perp \overline{AB}$, with sides as marked.
Find: CD , AD , AC



(26) Given the figure below. $\overline{BD} \perp \overline{AC}$, $\overline{AE} \perp \overline{CE}$, with sides as marked.
Find: AB , BC , BD



(27) Given the figure below, with sides and angles as marked, **find:** AE and AB



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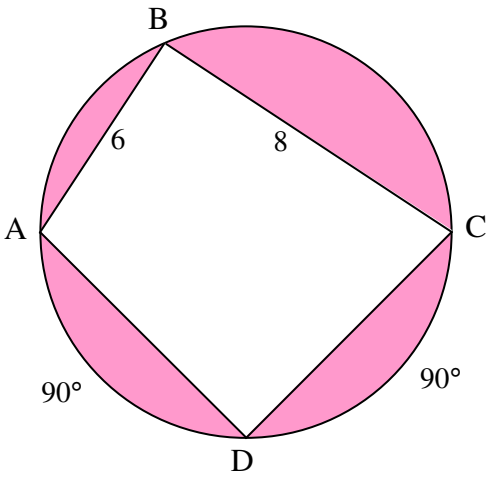
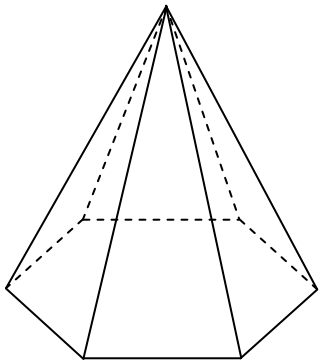
(28) Find the sum of the areas of the shaded regions in the figure below given lengths and arcs as marked.

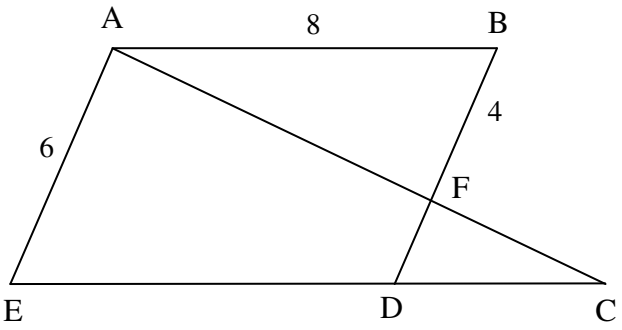


(29) Find the LSA , TSA , and volume of the right regular hexagonal pyramid below if the altitude is $4\sqrt{3}$ and each edge of the base is 6.



(31) $\square ABDE$ is a parallelogram in the figure below, with sides as marked. **Find:**

DE , CD , $\dfrac{a_{\triangle ABF}}{a_{\triangle CDF}}$, $\dfrac{a_{\triangle CDF}}{a_{\square DEAB}}$



(32) ΔABC has vertices A (−5 , 4) , B (1 , −2) and C (3 , 6).

(a) Write the equation of $\overleftrightarrow{AB}$.

(b) Write the equation of the altitude to $\overleftrightarrow{AC}$.

(c) Write the equation of the perpendicular bisector of $\overline{AC}$.

(d) Find the perimeter of ΔABC.

(e) Find the length of the median to $\overline{AB}$.

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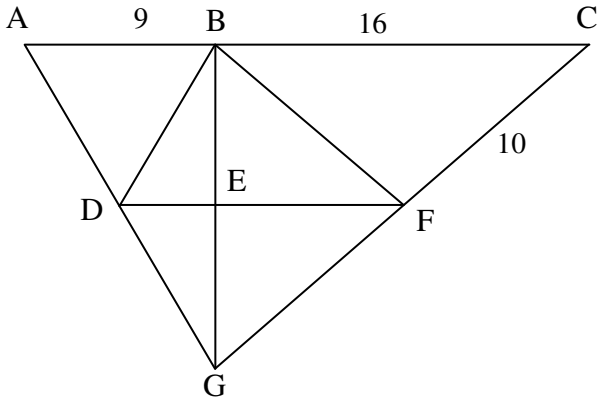
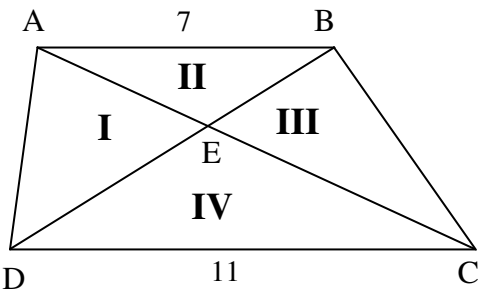
(33)



Given the figure above, $\overline{BG} \perp \overline{AC}$, D and F are midpoints.

Find: AG , BD , BG , EG , EF , BF

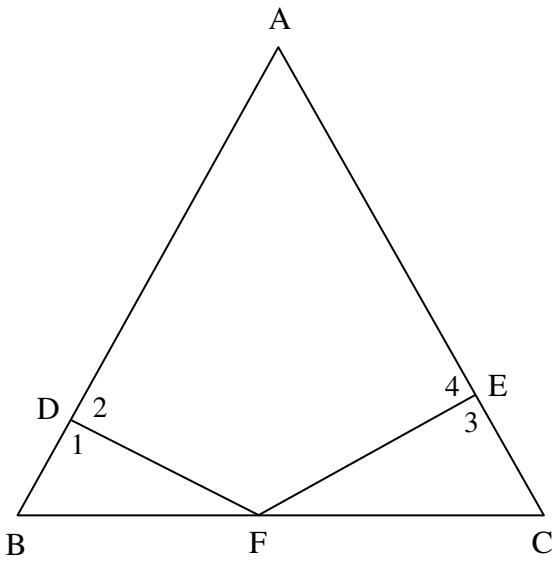
(34)



Given the figure above, $\overline{AB} \parallel \overline{CD}$, sides as marked. Find the ratio of the areas of each of the following.

$$\frac{a\Delta I}{a\Delta II}\ ,\ \frac{a\Delta I}{a\Delta III}\ ,\ \frac{a\Delta II}{a\Delta IV}\ ,\ \frac{a\Delta II}{a\square ABCD}$$

(35)



Given: $AB = AC$, $\overline{DF} \perp \overline{AB}$, $\overline{EF} \perp \overline{AC}$

Prove: $BD \bullet EF = CE \bullet DF$

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Answers

(1) $16\sqrt{3}$

(2) $x = 4$, $y = 3$, $z = \frac{13}{2}$

(3) Length of arc is 3π , area of sector is 15π

(4) Each side is 20 , area of the hexagon is $600\sqrt{3}$

(5) Volume is 400 , LSA is 260 , TSA is 360

(6) $m\overset{\frown}{BG} = 40^\circ$, $m\overset{\frown}{EF} = 90^\circ$, $m\overset{\frown}{DE} = 90^\circ$, $m\angle 1 = 20^\circ$,

$m\angle 2 = 10^\circ$, $m\angle 3 = 45^\circ$, $m\angle 4 = 70^\circ$, $m\angle 5 = 45^\circ$, $m\angle 6 = 55^\circ$

(7) 12

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Answers

(8) Area = $54\sqrt{3} + 54$, perimeter = $30 + 6\sqrt{6} + 6\sqrt{3}$

(9) CD = 12 , BD = 9 , area = 150

(10) BC = 13 , area $\square ABCD = 120$, AF = $\frac{120}{13}$

(11) Central angle is 150°, arc length of the sector is 5π

(12) Area inscribed circle is 12π , area circumscribed circle is 48π

(13) AB = 12

(14) DE = $\frac{14}{3}$, BE = $\frac{15}{2}$

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Answers

(15) BD = 6 , CD = 10

(16) LSA = 144 , TSA = 216 , Volume = 216 , BD = $6\sqrt{2}$, BH = $6\sqrt{3}$

(17) AB = 8

(18) $12\pi - 9\sqrt{3}$

(19) Volume pyramid = 32 , volume cone = 16π

(20) 36π

(21) side = 10 , altitude = $5\sqrt{3}$

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Answers

(22) $x = 3$

(23) $DE = 2$, $BE = 3$

(24) 16

(25) $CD = 8\sqrt{2}$, $AD = 32$, $AC = 24\sqrt{2}$

(26) $AB = \frac{40}{17}$, $BC = \frac{249}{17}$, $BD = \frac{75}{17}$

(27) $AE = \frac{38}{5}$, $AB = \frac{54}{5}$

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Answers

(28) $25\pi - 49$

(29) LSA = $90\sqrt{3}$, TSA = $144\sqrt{3}$, Volume = 216

(30) area = $48\pi + 18\sqrt{3}$, perimeter = 16π

(31) DE = 8 , CD = 4 , $\frac{a\triangle ABF}{a\triangle CDF} = \frac{4}{1}$, $\frac{a\triangle CDF}{a\square DEAB} = \frac{1}{12}$

(32) **(a)** $y = -x - 1$

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

(c) $y = -4x + 1$

(d) $4\sqrt{17} + 6\sqrt{2}$

(e) $5\sqrt{2}$

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Answers

(33) AG = 15 , BD = $\frac{15}{2}$, BG = 12 , EG = 6 , EF = 8 , BF = 10

(34) $\frac{a\Delta I}{a\Delta II} = \frac{11}{7}$, $\frac{a\Delta I}{a\Delta III} = \frac{1}{1}$, $\frac{a\Delta II}{a\Delta IV} = \frac{49}{121}$, $\frac{a\Delta II}{a\square ABCD} = \frac{49}{324}$