

GEOMETRY

Workbook

Common Core Standards Edition

Published by
TOPICAL REVIEW BOOK COMPANY

P. O. Box 328
Onsted, MI 49265-0328
www.topicalrbc.com

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Common Core High School Math Reference Sheet
(Algebra I, Geometry, Algebra II)

CONVERSIONS

1 inch = 2.54 centimeters	1 kilometer = 0.62 mile	1 cup = 8 fluid ounces
1 meter = 39.37 inches	1 pound = 16 ounces	1 pint = 2 cups
1 mile = 5280 feet	1 pound = 0.454 kilograms	1 quart = 2 pints
1 mile = 1760 yards	1 kilogram = 2.2 pounds	1 gallon = 4 quarts
1 mile = 1.609 kilometers	1 ton = 2000 pounds	1 gallon = 3.785 liters
		1 liter = 0.264 gallon
		1 liter = 1000 cubic centimeters

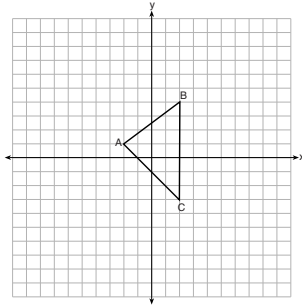
FORMULAS

Triangle	$A = \frac{1}{2}bh$	Pythagorean Theorem	$a^2 + b^2 = c^2$
Parallelogram	$A = bh$	Quadratic Formula	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
Circle	$A = \pi r^2$	Arithmetic Sequence	$a_n = a_1 + (n - 1)d$
Circle	$C = \pi d$ or $C = 2\pi r$	Geometric Sequence	$a_n = a_1 r^{n-1}$
General Prisms	$V = Bh$	Geometric Series	$S_n = \frac{a_1 - a_1 r^n}{1 - r}$ where $r \neq 1$
Cylinder	$V = \pi r^2 h$	Radians	1 radian = $\frac{180}{\pi}$ degrees
Sphere	$V = \frac{4}{3}\pi r^3$	Degrees	1 degree = $\frac{\pi}{180}$ radians
Cone	$V = \frac{1}{3}\pi r^2 h$	Exponential Growth/Decay	$A = A_0 e^{k(t-t_0)} + B_0$
Pyramid	$V = \frac{1}{3}Bh$		

Part I

Answer all 24 questions in this part. Each correct answer will receive 2 credits. No partial credit will be allowed. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily drawn to scale. For each statement or question, choose the word or expression that, of those given, best completes the statement or answers the question. Record your answers in the space provided [48]

1. Triangle $A'B'C'$ is the image of $\triangle ABC$ after a dilation centered at the origin. The coordinates of the vertices of $\triangle ABC$ are $A(-2, 1)$, $B(2, 4)$, and $C(2, -3)$.

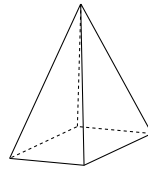


If the coordinates of A' are $(-4, 2)$, the coordinates of B' are

- (1) $(8, 4)$ (3) $(4, -6)$
(2) $(4, 8)$ (4) $(1, 2)$

1 _____

2. In the diagram, a plane intersects a square pyramid parallel to its base.

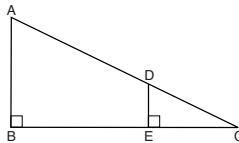


Which two-dimensional shape describes this cross section?

- (1) circle (3) triangle
(2) square (4) pentagon

2 _____

3. In the diagram, $\triangle CDE$ is the image of $\triangle CAB$ after a dilation of $\frac{DE}{AB}$ centered at C .



Which statement is always true?

- (1) $\sin A = \frac{CE}{CD}$ (2) $\cos A = \frac{CD}{CE}$ (3) $\sin A = \frac{DE}{CD}$ (4) $\cos A = \frac{DE}{CE}$ 3 _____

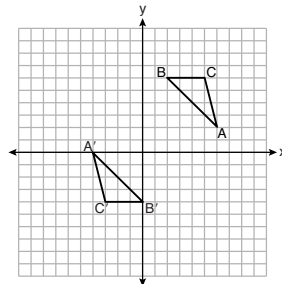
4. A regular pentagon is rotated about its center. What is the minimum number of degrees needed to carry the pentagon onto itself?

- (1) 72° (2) 108° (3) 144° (4) 360° 4 _____

5. On the set of axes, $\triangle ABC \cong \triangle A'B'C'$.

Triangle ABC maps onto $\triangle A'B'C'$ after a

- (1) reflection over the line $y = -x$
(2) reflection over the line $y = -x + 2$
(3) rotation of 180° centered at $(1, 1)$
(4) rotation of 180° centered at the origin



5 _____

6. Right triangle TMR is a scalene triangle with the right angle at M .

Which equation is true?

(1) $\sin M = \cos T$

(3) $\sin T = \cos R$

(2) $\sin R = \cos R$

(4) $\sin T = \cos M$

6 _____

7. In the diagram of $\triangle AED$ and

$\overline{ABCD}$, $\overline{AE} \cong \overline{DE}$.

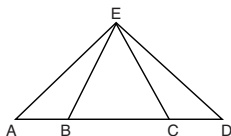
Which statement is always true?

(1) $\overline{EB} \cong \overline{EC}$

(3) $\angle EBA \cong \angle ECD$

(2) $\overline{AC} \cong \overline{DB}$

(4) $\angle EAC \cong \angle EDB$



7 _____

8. As shown in the diagram, right triangle ABC has side lengths of 8 and 15.

If the triangle is continuously rotated about $\overline{AC}$, the resulting figure will be

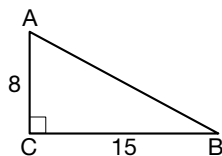
(1) a right cone with a radius of 15 and a height of 8

(2) a right cone with a radius of 8 and a height of 15

(3) a right cylinder with a radius of 15 and a height of 8

(4) a right cylinder with a radius of 8 and a height of 15

8 _____



9. In the diagram, lines k and ℓ intersect lines m and n at points A, B, C , and D .

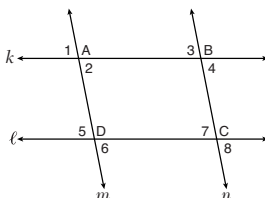
Which statement is sufficient to prove $ABCD$ is a parallelogram?

(1) $\angle 1 \cong \angle 3$

(3) $\angle 2 \cong \angle 5$ and $\angle 5 \cong \angle 7$

(2) $\angle 4 \cong \angle 7$

(4) $\angle 1 \cong \angle 3$ and $\angle 3 \cong \angle 4$



9 _____

10. Which transformation does *not* always preserve distance?

(1) $(x, y) \rightarrow (x + 2, y)$

(3) $(x, y) \rightarrow (2x, y - 1)$

(2) $(x, y) \rightarrow (-y, -x)$

(4) $(x, y) \rightarrow (3 - x, 2 - y)$

10 _____

11. In the diagram, $\overline{EF} \parallel \overline{HG}$, $EF = 5$, $HG = 12$, $FI = 1.4x + 3$, and $HI = 6.1x - 6.5$.

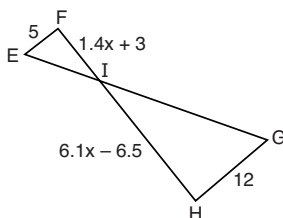
What is the length of $\overline{HI}$?

(1) 1

(3) 10

(2) 5

(4) 24



11 _____

12. The square pyramid models a toy block made of maple wood.

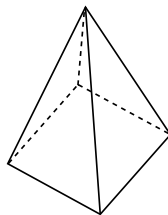
Each side of the base measures 4.5 cm and the height of the pyramid is 10 cm. If the density of maple is 0.676 g/cm^3 , what is the mass of the block, to the *nearest tenth of a gram*?

(1) 45.6

(3) 136.9

(2) 67.5

(4) 202.5

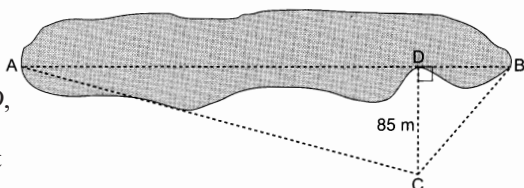


12 _____

Part III

Answer all 3 questions in this part. Each correct answer will receive 4 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily drawn to scale. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be be done in pencil. [12]

32. Trish is a surveyor who was asked to estimate the distance across a pond. She stands at point C , 85 meters from point D , and locates points A and B on either side of the pond such that A , D , and B are collinear.

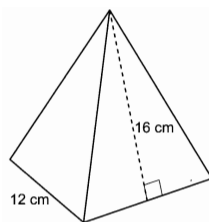


Trish approximates the measure of angle DCB to be 35° and the measure of angle ACD to be 75° .

Determine and state the distance across the pond, $\overline{AB}$, to the nearest meter.

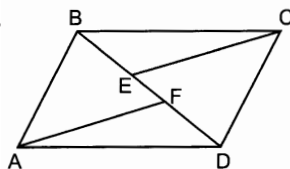
33. A candle in the shape of a right pyramid is modeled. Each side of the square base measures 12 centimeters. The slant height of the pyramid measures 16 centimeters.

Determine and state the volume of the candle, to the nearest cubic centimeter.



The wax used to make the candle weighs 0.032 ounce per cubic centimeter. Determine and state the weight of the candle, to the nearest ounce.

34. In the diagram of quadrilateral $ABCD$, $\overline{AB} \cong \overline{CD}$, and $\overline{AB} \parallel \overline{CD}$. Segments CE and AF are drawn to diagonal $\overline{BD}$ such that $\overline{BE} \cong \overline{DF}$.



Prove: $\overline{CE} \cong \overline{AF}$

Part IV

Answer the question in this part. A correct answer will receive 6 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. Utilize the information provided for each question to determine your answer. Note that diagrams are not necessarily drawn to scale. A correct numerical answer with no work shown will receive only 1 credit. All answers should be written in pen, except for graphs and drawings, which should be done in pencil. [6]

35. Quadrilateral $MATH$ has vertices with coordinates $M(-1, 7)$, $A(3, 5)$, $T(2, -7)$, and $H(-6, -3)$.

Prove that quadrilateral $MATH$ is a trapezoid. [The use of the set of axes on the next page is optional.]

State the coordinates of point Y such that point A is the midpoint of $\overline{MY}$.

Prove that quadrilateral *MYTH* is a rectangle. [The use of the set of axes below is optional.]

