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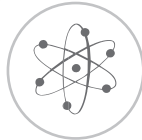
Georgia



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Course



Tests

Analytic Geometry Released Items

Revised August 27, 2013



Dr. John D. Barge
State School Superintendent
Georgia Department of Education
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Analytic Geometry Formula Sheet

Below are the formulas you may find useful as you work the problems. However, some of the formulas may not be used. You may refer to this page as you take the test.

Area

Rectangle/Parallelogram $A = bh$

Triangle $A = \frac{1}{2}bh$

Circle $A = \pi r^2$

Circumference

$C = \pi d$ $\pi \approx 3.14$

$C = 2\pi r$

Volume

Rectangular Prism/Cylinder $V = Bh$

Pyramid/Cone $V = \frac{1}{3}Bh$

Sphere $V = \frac{4}{3}\pi r^3$

Surface Area

Rectangular Prism $SA = 2lw + 2wh + 2lh$

Cylinder $SA = 2\pi r^2 + 2\pi rh$

Sphere $SA = 4\pi r^2$

Trigonometric Relationships

$$\sin(\theta) = \frac{\text{opp}}{\text{hyp}}; \cos(\theta) = \frac{\text{adj}}{\text{hyp}}; \tan(\theta) = \frac{\text{opp}}{\text{adj}}$$

Quadratic Equations

Standard Form: $y = ax^2 + bx + c$

Vertex Form: $y = a(x - h)^2 + k$

Quadratic Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Conic Sections

Parabola: $y - k = \frac{1}{4p}(x - h)^2$

$$x - h = \frac{1}{4p}(y - k)^2$$

Circle: $(x - h)^2 + (y - k)^2 = r^2$

Distance Formula

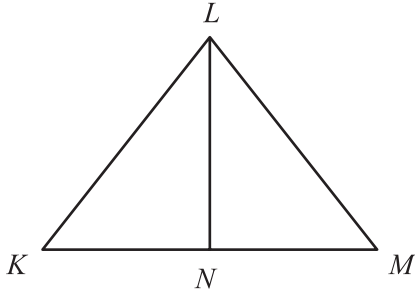
$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Conditional Probability

$$P(A|B) = \frac{P(A \text{ and } B)}{P(B)}$$

ANALYTIC GEOMETRY – SECTION I

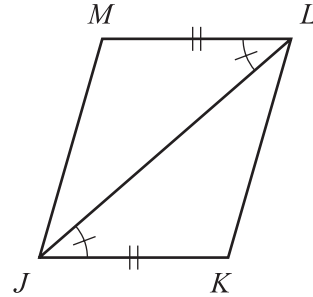
1 In this figure, $\overline{LN} \perp \overline{KM}$.



What information would a student need to prove $\triangle KLN \sim \triangle MLN$?

- A $\angle LKN \cong \angle LMN$
- B $\angle LNK \cong \angle LNM$
- C $\angle KLN \cong \angle LNM$
- D $\angle LKN \cong \angle NLM$

2 This figure shows quadrilateral $JKLM$.

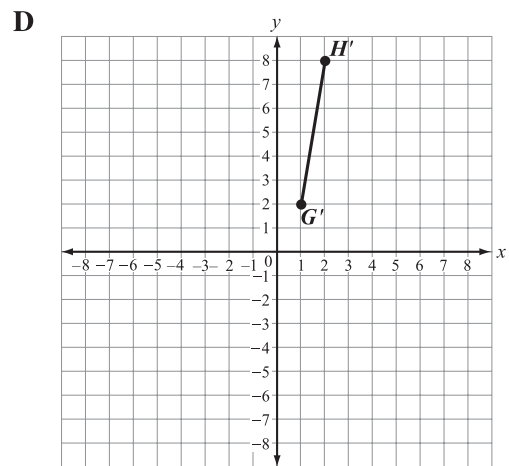
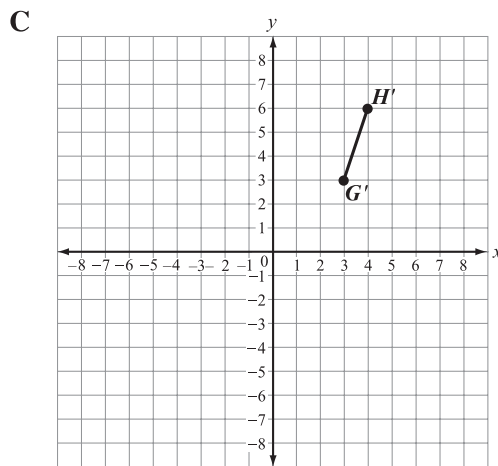
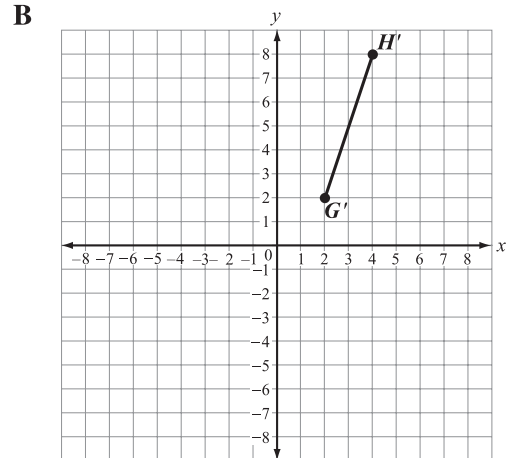
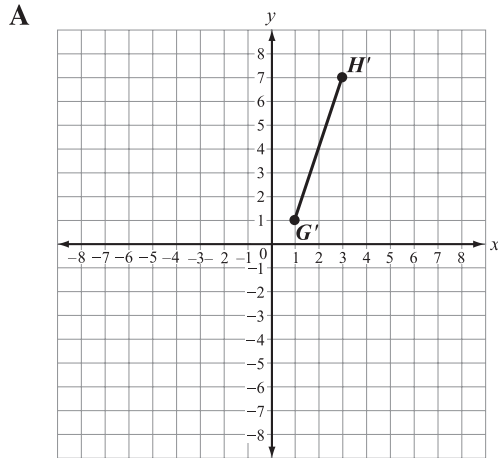
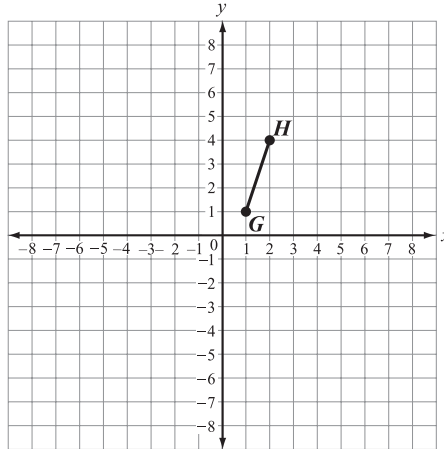


What information will NOT be used to prove that $JKLM$ is a parallelogram?

- A Show that $\angle JLM \cong \angle LJK$.
- B Show that $\overline{JK} \cong \overline{LM}$.
- C Show that $\triangle JKL \cong \triangle LMJ$.
- D Show that $\triangle JKL \cong \triangle JLM$.

ANALYTIC GEOMETRY – SECTION I

3 Which figure represents the dilation of segment \overline{GH} about the origin by a scale factor of 2?

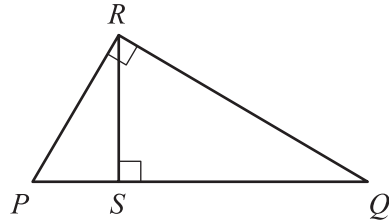


ANALYTIC GEOMETRY – SECTION I

4 Which transformation of $\triangle HIJ$ does NOT result in a congruent triangle?

- A a reflection across the x -axis, followed by a rotation of 180° about the origin
- B a rotation by 180° about the origin, followed by a translation of 2 units left and 3 units down
- C a translation of 1 unit right and 2 units up, followed by a dilation by a factor of 3
- D a dilation by a factor of 2, followed by a dilation by a factor of 0.5

5 This is a proof of the Pythagorean theorem.



	Step	Justification
1	$\triangle PQR$, $\triangle PRS$, and $\triangle RQS$ are similar	AA postulate
2	$\frac{PQ}{QR} = \frac{QR}{SQ}$ and $\frac{PQ}{PR} = \frac{PR}{PS}$?
3	$QR^2 = PQ \cdot SQ$ and $PR^2 = PQ \cdot PS$	Multiplication property of equality
4	$QR^2 + PR^2 = PQ \cdot SQ + PQ \cdot PS$	Addition property
5	$QR^2 + PR^2 = PQ(SQ + PS)$	Distributive property
6	$QR^2 + PR^2 = PQ(PQ)$	Segment addition postulate
7	$QR^2 + PR^2 = PQ^2$	Product of powers

Which reason justifies Step 2?

- A Triangle proportionality theorem.
- B Corresponding sides of similar triangles are proportional.
- C Corresponding sides of similar triangles are congruent.
- D Triangle mid-segment theorem.

- 6 Use line segment \overline{HI} to answer the question.

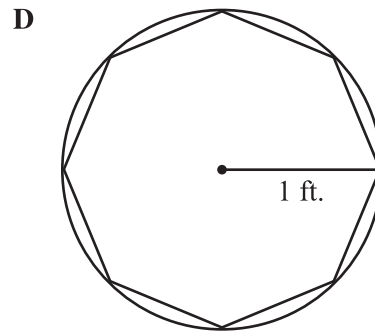
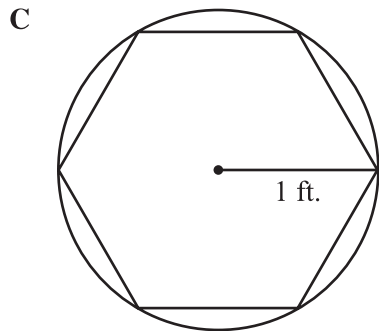
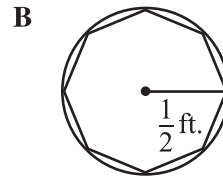
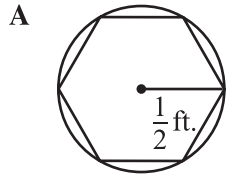


Which step should be first to draw a line perpendicular to \overline{HI} at point J ?

- A Place the compass on point H and set its width to less than \overline{HJ} .
- B Place the compass on point H and set its width to more than \overline{HJ} .
- C Place the compass on point J and set its width to less than \overline{HI} .
- D Place the compass on point J and set its width to more than \overline{HI} .

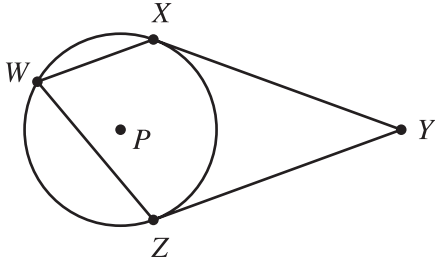
ANALYTIC GEOMETRY – SECTION I

7 Which polygon inscribed in a circle has an area closest to π square feet?



ANALYTIC GEOMETRY – SECTION I

- 8** Circle P has tangents \overline{XY} and \overline{ZY} and chords \overline{WX} and \overline{WZ} , as shown in this figure. The measure of $\angle ZWX = 70^\circ$.



What is the measure, in degrees, of $\angle XYZ$?

- A 20°
 - B 35°
 - C 40°
 - D 55°
- 9** Which statement is true for any two circles?
- A The ratio of the areas of the circles is the same as the ratio of their radii.
 - B The ratio of the circumferences of the circles is the same as the ratio of their radii.
 - C The ratio of the areas of the circles is the same as the ratio of their diameters.
 - D The ratio of the areas of the circles is the same as the ratio of their circumferences.

- 10** Which statement is true about this expression?

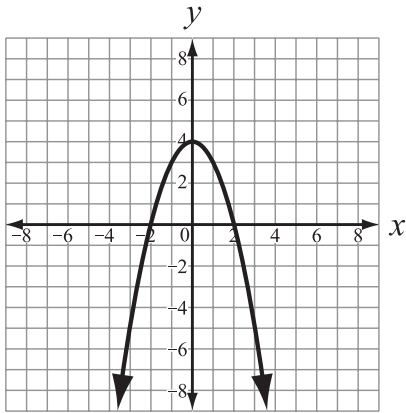
$$\sqrt{5}(3 + \sqrt{4}) + \frac{4}{5}$$

- A It is rational because it is the sum of two irrational numbers.
- B It is irrational because it is the sum of two irrational numbers.
- C It is rational because it is the sum of a rational number and an irrational number.
- D It is irrational because it is the sum of a rational number and an irrational number.

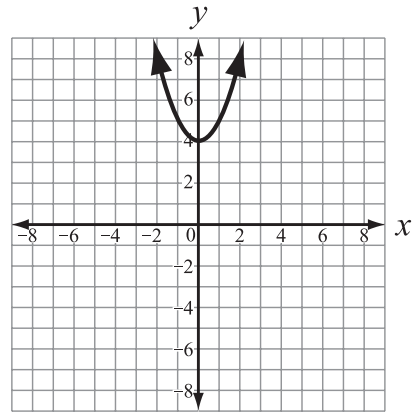
ANALYTIC GEOMETRY – SECTION I

11 Which graph represents all points that form the solution to the equation $y + x^2 = 4$?

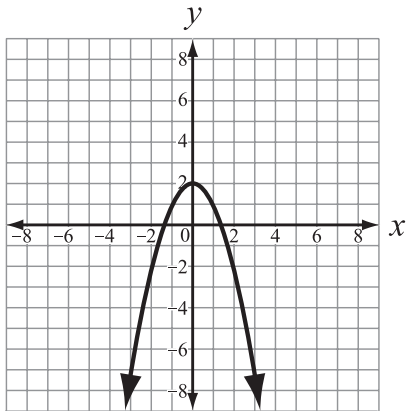
A



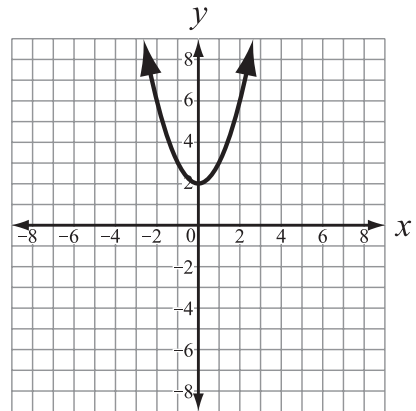
B



C



D



ANALYTIC GEOMETRY – SECTION I

12 What are the solutions to the equation $x^2 + 4x + 5 = 0$?

- A $2 \pm i$
- B $-2 \pm i$
- C $-4 \pm 2i$
- D $4 \pm 2i$

13 Which function best represents a quadratic function of x ?

A

x	0	1	2	3	4
$f(x)$	0	2	4	6	8

B

x	0	1	2	3	4
$g(x)$	1	3	9	19	33

C

x	0	1	2	3	4
$h(x)$	1	2	4	8	16

D

x	0	1	2	3	4
$k(x)$	0	10	20	30	40

ANALYTIC GEOMETRY – SECTION I

14 As the value of x increases, which function has the greatest rate of growth?

- A $f(x) = x^2 + 7$
- B $g(x) = 2 + 7^x$
- C $h(x) = 7 - x^2$
- D $k(x) = 2^x + 7$

15 The line $y = -2$ is the directrix of the parabola $y = -x^2 + 4x - \frac{25}{4}$.

What are the coordinates of the FOCUS of the parabola?

- A $\left(2, -\frac{7}{4}\right)$
- B $(2, -2)$
- C $\left(2, -\frac{9}{4}\right)$
- D $\left(2, -\frac{5}{2}\right)$

ANALYTIC GEOMETRY – SECTION I

16 The graph of a circle has its center at $(2, 3)$ with a radius of 10 units. Which point does NOT lie on the circle?

- A $(-4, -5)$
- B $(8, 11)$
- C $(-2, 6)$
- D $(-4, 11)$

17 In soccer, a shutout is a game where the winning team does not allow the other team to score a goal.

If the set W represents all wins, and S represents all shutouts, which set describes the set of shutout wins?

- A $W \cap S$
- B $W \cup S$
- C $W' \cap S'$
- D $(W \cup S)'$

ANALYTIC GEOMETRY – SECTION I

18 Which two-way frequency table shows that $P(W|Y) = 0.25$?

A

	Event Y	Event Z	Total
Event W	12	24	36
Event X	36	28	64
Total	48	52	100

B

	Event Y	Event Z	Total
Event W	12	36	48
Event X	26	26	52
Total	38	62	100

C

	Event Y	Event Z	Total
Event W	25	21	46
Event X	12	42	54
Total	37	63	100

D

	Event Y	Event Z	Total
Event W	10	26	36
Event X	40	24	64
Total	50	50	100



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