1. The angles of a triangle are in the ratio 1:3:5. What is the measure, in degrees, of the largest angle?

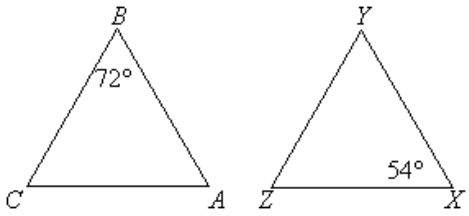
- A. 20°
- B. 30°
- C. 60°
- D. 100°

2. Which construction represents the center of a circle that is inscribed in a triangle?

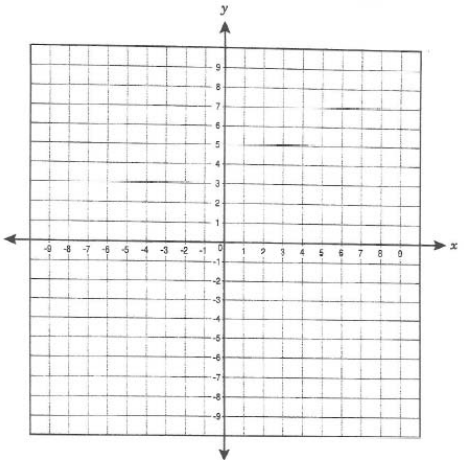
- A. The intersection of the three altitudes of the triangle..
- B. The intersection of the three medians of the triangle.
- C. The intersection of the angle bisectors of each angle of the triangle.
- D. The intersection of the perpendicular bisectors of each side of the triangle.

3. $\triangle ABC$ and $\triangle XYZ$ are congruent isosceles triangles. What is the measure of angle A?

- A. 8°
- B. 54°
- C. 72°
- D. 180°



4. Three vertices of a square have coordinates (3,1), (4, -4) and (-1, -5). The diagonals of the square intersect at point Q. Determine the coordinates of point Q. You may use the blank grid to help determine the solution.



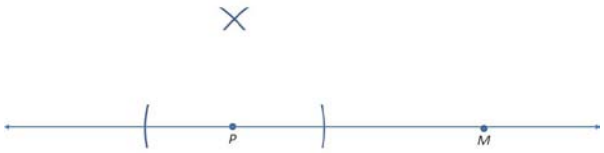
5. Martina has a calculator box that has a volume of 29 cubic inches.
1 inch = 2.54 centimeters
Determine the volume of the calculator box to the nearest cubic centimeter.

6. Determine the converse of the given statement.
If the table top is rectangular, then its diagonals are congruent.
Which is the converse of this statement?

- A. If a table top is rectangular, then its diagonals are not congruent
- B. If the diagonals of a table top are congruent, then it is rectangular.
- C. If a table top is not rectangular, then its diagonals are not congruent.
- D. If the diagonals of a table top are not congruent, then it is not rectangular.

7. Given line $\overleftrightarrow{PM}$, the drawing shows the beginning steps of a geometric construction. Which construction is illustrated here?

- A. A perpendicular bisector of line $\overleftrightarrow{PM}$.
- B. A line parallel to line $\overleftrightarrow{PM}$ through point *P*.
- C. A line perpendicular to a line $\overleftrightarrow{PM}$ at point *M*.
- D. A line perpendicular to line $\overleftrightarrow{PM}$ at point *P*.



8. Maria is flying a kite on the beach. She holds the end of the string 4 feet above ground level and determines the angle of elevation of the kite to be 54□. If the string is 70 feet long, how high is the kite above the ground to the *nearest foot*?

9. There are 5 horses on 12 acres of land.
1 acre = 43,560 square feet
What is the mean number of square **yards** per horse?

- A. 34,848 square yards
- B. 8,712 square yards
- C. 11,616 square yards
- D. 104,544 square yards

10. What is the length of the altitude to the hypotenuse in a right triangle if this altitude divides the hypotenuse into segments of lengths 8 millimeters and 18 millimeters?

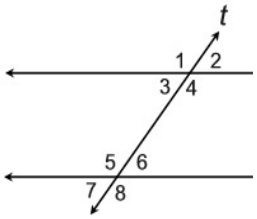
- A. 12 mm
- B. 13 mm
- C. 26 mm
- D. 36 mm

11. When finished with the construction for "Copy an Angle", segments are drawn connecting where the arcs cross the sides of the angles. What method proves these two triangles to be congruent?

- A. ASA
- B SSS.
- C. SAS
- D. AAS

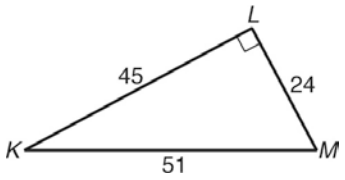
12. In the diagram below, lines *a* and *m* are parallel and are cut by transversal *t*. Which two angles are not always congruent?

- A. <4 and <6
- B. <1 and <8
- C. <4 and <5
- D. <2 and <3

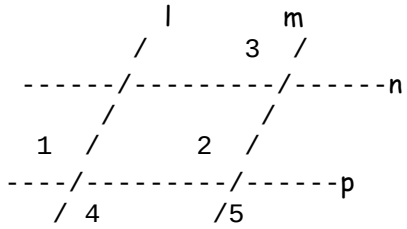


13. What is tan K?

- A. $\frac{8}{17}$
- B. $\frac{15}{17}$
- C. $\frac{8}{15}$
- D. $\frac{15}{8}$



14. Given: <1 ≅ <2, <3 ≅ <4
Which statement MAY NOT be true?



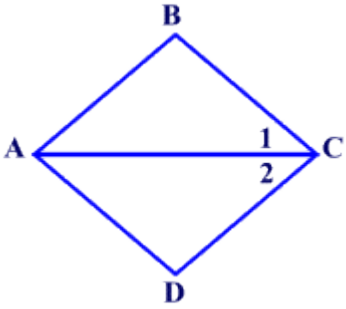
- A. *line l || line m*
- B < 1 ≅ < 3
- C. *the opposite angles of the quadrilateral formed are two pairs of congruent angles*
- D. *quadrilateral formed must be a rectangle*

15. What is the missing reason?

Given: $\overline{BC} \cong \overline{CD}$

$\overline{AC}$ bisects $\angle BCD$

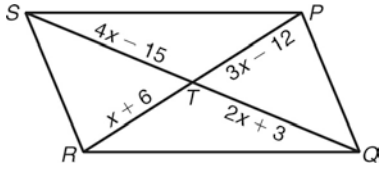
Prove: $\Delta ABC \cong \Delta ADC$



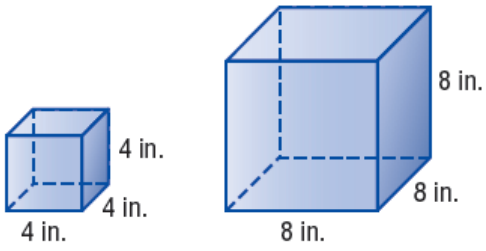
$\overline{BC} \cong \overline{CD}$	*1. Given*	○ A.	CPCTC
$\angle 1 \cong \angle 2$	*2. #15*	○ B.	Definition of congruent
$\overline{AC} \cong \overline{AC}$	*3. Reflexive Property (a quantity is congruent to itself)*	○ C.	For two congruent segments, their adjacent angles are congruent.
$\Delta ABC \cong \Delta ADC$	*4. (SAS) If two sides and the included angle of one triangle are congruent to the corresponding parts of a second triangle, the triangles are congruent.*	○ D.	An angle bisector is a ray whose endpoint is the vertex of the angle and divides the angle into two congruent angles.

16. *PQRS* is a parallelogram. Find *x*.

- A. X=3
- B X=7
- C. X=9
- D. X=15

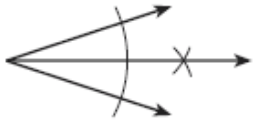


17. What happens to the surface area of a cube if the edges are doubled?

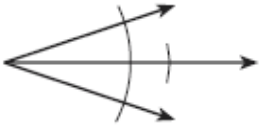


18. Which diagram below shows a correct mathematical construction using only a compass and a straightedge to bisect an angle?

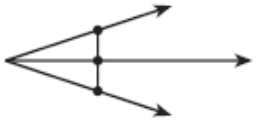
A



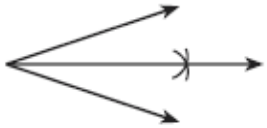
B.



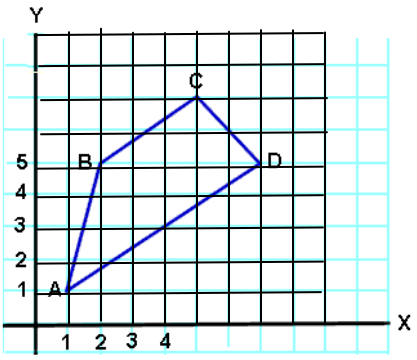
C



D.



19. (*2 pt response)*
Given: A(1,1), B(2, 5), C(5, 7), D(7, 5)
Prove ABCD is a trapezoid.



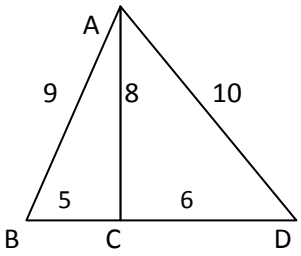
20. Which angle has a cosine of $\frac{3}{5}$?

A. < CAD

B. < ADC

C. < ABC

D. < CBA



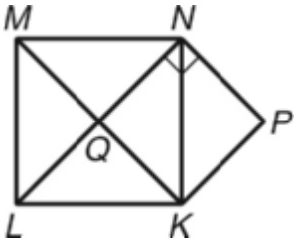
21.
KLMN is a square and *LN* ⊥ *NP* . Which can be proved?

A $\triangle KPN \cong \triangle KQN$

B $\overline{PN} || \overline{KM}$

C. KQ = PN

D. KP = $\frac{1}{2}$LN



22. The coordinates of the vertices of parallelogram *ABCD* are *A*(−3,2), *B*(−2,−1), *C*(4,1), and *D*(3,4). The slopes of which line segments could be calculated to show that *ABCD* is a rectangle?

- A. $\overline{AB}$ and $\overline{DC}$
- B. $\overline{AB}$ and $\overline{BC}$
- C. $\overline{AD}$ and $\overline{BC}$
- D. $\overline{AC}$ and $\overline{BD}$

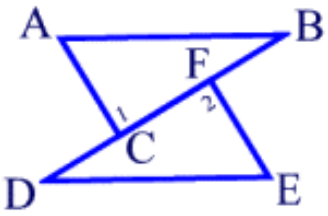
23. Which of the following sets of numbers could represents the lengths of the sides of a right triangle?

- A. {8,10,12}
- B. {25, 31, 40}
- C. {16, 30, 34}
- D. {19, 20, 22}

Questions # 24 & #25 below…..

Given $\overline{AC} \cong \overline{EF}$; $\overline{AC} \parallel \overline{DB}$; $\overline{EF} \parallel \overline{DB}$

Prove: < B ≅ < D



1) $\overline{AC} \perp \overline{DB}$; $\overline{EF} \perp \overline{DB}$ $\overline{AC} \cong \overline{EF}$; $\angle A \cong \angle E$	1) GIVEN
2) #24	2) Perpendicular lines meet to form right angles
3) $\Delta ABC \cong \Delta EDF$	3) ASA
4) $\angle B \cong \angle D$	4) #25

 # 24 Which is the missing statement?

- A. < B ≅< D
- B. <1 ≅< 2
- C. <A & < E are RighT Angles
- D. < 1 & < 2 are Right Angles

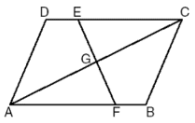
#25 Which is the missing reason?

- A. Vertices are ≅
- B. CPCTC
- C. Definition of Congruent
- D. Perpendicular lines make triangles congruent

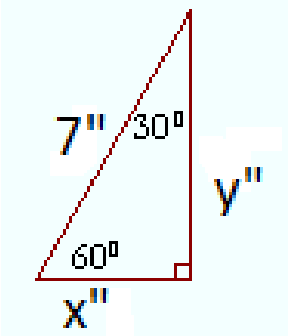
26. A parallelogram must be a rectangle if its diagonals :

- A. bisect each other
- B. bisect the angles to which they are drawn
- C. are perpendicular to each other.
- D. are congruent

27. In quadrilateral ABCD, DE = BF. Then △EGC ≅ △FGA by:

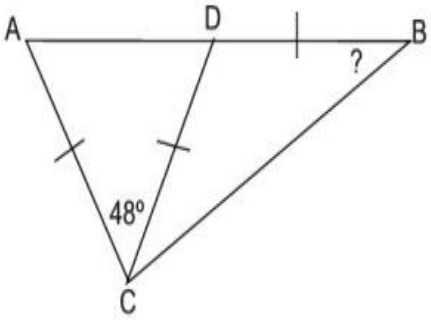


28. Given the triangle below, what is the length of x? (round to nearest 0.1")

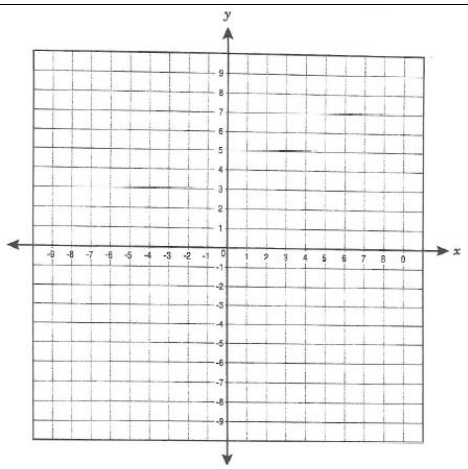


29. *(2 pt)* In the diagram below $\overline{AC} \cong \overline{DC} \cong \overline{DB}$.

If the $m<ACD = 48$, find the $m<B$.



30. Given a line with y-intercept(0,4) and x-intercept (3,0), find the area of the square with one corner on the origin and the opposite corner on the line described above.



○	A. about 2 sq units
○	B… about 2.5 sq units
○	C.. about 3.5 sq units
○	D… about 12 sq units

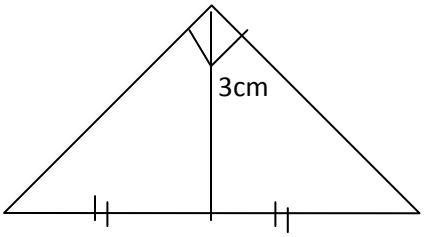
31. Two joggers run 8 miles north and then 5 miles west. What is the shortest distance, to the *nearest tenth of a mile*, they must travel to return to their starting point?

32. *(2pt response)*

" If a measurement made with a metric ruler is 5.6 cm and the ruler has a precision of 0.1 cm, then the measurement is 5.6 $\pm$ 0.05 cm, or from 5.55 cm to 5.65 cm. Any measurements within this range are 'tolerated' or perceived as correct."

Explain why you might use this degree of precision in measuring, and what is meant by the ruler having "*a precision of 0.1cm".*

33. Given an isosceles triangle with vertex angle 90°. You drop a line segment from the vertex to the opposite side, to intersect at the midpoint. The segment you drew has a length of 3cm. What is the length of one of the isosceles sides?



- A. $\frac{\sqrt{3}}{2}$
- B. $\sqrt{3}$
- C. 3
- D. $3\sqrt{2}$

34. Given a quadrilateral with one set of opposite angles congruent, John says the quadrilateral must be a parallelogram. Kelly says that is not true, it does not HAVE to be a parallelogram. John says we need only check this statement and its converse.

S1: *If a quadrilateral is a parallelogram, then at least one set of its opposite angles are congruent.*

S2: *If at least one set of opposite angles of a quadrilateral are congruent, then it is a parallelogram*

Check these two statements for truth and decide if John or Kelly is right, stating WHY he/she is right.

35. Which are not used as reasons in geometric proofs:

- A. Given
- B. Prove
- C. Definition
- D. Theorem

36. Given the statement: if p then q , which is the inverse:

- A. If not p, then not q
- B. If not q, then not p
- C. If q, then p
- D. If p, then not q

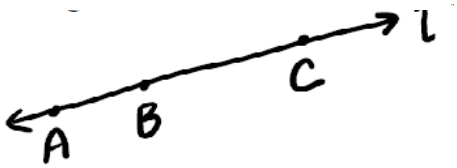
37. If both pairs of opposite angles of a quadrilateral are congruent, the quadrilateral MUST be a:

38. Identify an example of an undefined term:

- A. a point
- B. collinear points
- C. non-collinear points
- D. coplanar points

39. All of the following are correct names for the line drawn below *except:*

- **A.** *l*
- **B.** *line* $\overleftrightarrow{AB}$
- C. *line* $\overleftrightarrow{BA}$
- D. *line* $\overleftrightarrow{A}$



40. Identify the error(s) in reasoning in the following proof. *You may draw the picture if you wish.*

A.	$< ABC \cong < PRQ$, $\overline{AB} \cong \overline{PQ}$; $\overline{BC} \cong \overline{QR}$	$Given$
B.	$\overline{AB}$ & $\overline{CB}$ form < ABC $\overline{RQ}$ & $\overline{PR}$ form < PRQ	*by Def of Angle*
C	△ABC has vertices A, B & C △ PQR has vertices P, Q & R	*Def of Triangle*
D.	△ABC ≅ △PQR	*by SAS*

Geometry Practice Exam –Version A (MIXED)

ANSWER KEY

1. **…D**
G.3.A (MC, SA)
Know, explain, and apply basic postulates and theorems about triangles and the special lines, line segments, and rays associated with a triangle.

2. **…C**
G.3.I (MC)
Explain and perform constructions related to the circle.

3. …B
G.3.A (MC, SA)
Know, explain, and apply basic postulates and theorems about triangles and the special lines, line segments, and rays associated with a triangle

4. **…(1, -2)**
G.4.B (MC, CP)
Determine the coordinates of a point that is described geometrically.

5. **…475 cc**
G.6.F (MC, CP)
Solve problems involving measurement conversions within and between systems, including those involving derived units, and analyze solutions in terms of reasonableness of solutions and appropriate units.

6. **…B**
G.1.D (MC, SA)
Write the **converse**, inverse, and contra-positive **of** a **valid proposition** and determine their validity.

7. …D
G.2.C (MC)
Explain and perform **basic compass and straightedge constructions** related to parallel and **perpendicular** lines.

8. **…61ft**
G.3.E
Solve problems involving the **basic trigonometric** ratios of sine, cosine, and **tangent**.

9. …**C**
G.6.F (MC, CP)
Solve problems involving measurement conversions within and between systems, including those involving derived units, and analyze solutions in terms of reasonableness of solutions and appropriate units.

10. ….A
G.3.B
Determine and prove triangle congruence, triangle similarity, and other properties of triangles.

11. **…C**
G.2.C (MC)
Explain and perform **basic compass and straightedge constructions** related to parallel and **perpendicular** lines.

12. **..A**
G.2.B
Know, prove, **and apply theorems about angles**, including angles that arise from **parallel lines intersected by a transversal.**

13. **…C**
G.3.E
Solve problems involving the **basic trigonometric** ratios of sine, cosine, and **tangent**.

14. …**D**
G.3.F
Know, prove, and apply basic theorems about parallelograms

15. **…D**
G.3.B
Determine and prove **triangle congruence**, triangle similarity, and other properties of triangles.

16. …C
. G.3.F (MC, CP)
Know, prove, and apply basic theorems about parallelograms.

17. **….Surface Area is 4x bigger (2x2)**
G.6.D (MC, CP)
Predict and verify the effect that **changing** one, **two**, or three linear dimensions has on perimeter, area, volume, or surface area of two- and three-dimensional figures

18. …A
G.2.C (MC)
Explain and perform **basic compass and straightedge constructions** related to parallel and perpendicular lines

19. *(2pt response)*
… BC || AD (slopes)….. AB NOT || CD (slopes)
G.4.C (MC, SA)
Verify and apply properties of triangles and quadrilaterals in the coordinate plane.

20. **…B**
G.3.E (MC, CP)
Solve problems involving the basic **trigonometric** ratios of sine, **cosine**, and tangent.

21. B
G.3.G (MC, CP)
Know, prove, and apply theorems about properties of quadrilaterals and other polygons.

22. …B
G.4.B (MC, CP)
Determine the coordinates of a point that is described geometrically.

23. **…C**
G.3.D (MC, CP)
Know, prove, and apply the Pythagorean Theorem and its converse.

24. **…D**
G.3.B
Determine and prove triangle congruence, triangle similarity, and other properties of triangles.

25. **..B**
G.3.B
Determine and prove triangle congruence, triangle similarity, and other properties of triangles.

26. **…D**
G.3.F (MC, CP)
Know, prove, and apply basic theorems about parallelograms.

27. SAS OR SSS
G.3.B (MC, SA)
Determine and prove triangle congruence, triangle similarity, and other properties of triangles

28. **…3.5"**
G.3.C (MC, CP)
Use the properties of special right triangles (30°–60°–90° and 45°–45°–90°) to solve problems.

29. (*2pts)*
(1pt – found left isosceles @66 ea,*
then subt to find vertex, then calc to find answer)
…33*
G.3.B (MC, SA)
Determine and **prove** triangle congruence, triangle similarity, and other **properties of triangles**

30. …C
G.6.F (MC, CP)
Solve problems involving measurement conversions within and between sy stems, including those involving derived units, and analyze solutions in terms of reasonableness of solutions and appropriate units.

31. **….. 9.4 miles**
G.3.D (MC, CP)
Know, prove, and apply the Pythagorean Theorem and its converse.

32. *(2pt response)*
Examples only….
you might be measuring a section of pipe and need it measured to the nearest 1/10th of a centimeter
The precision of 0.1cm means it will be accurate within 1/10 cm (1/20 cm either way)
G.6.E (MC, SA)
Use different degrees of precision in measurement, explain the reason for using a certain degree of precision, and apply estimation strategies to obtain reasonable measurements with appropriate precision for a given purpose.

33. **…D**
G.3.C (MC, CP)
Use the properties of special right triangles (30°–60°–90° and 45°–45°–90°) to solve problems.

34. (*2pt)*
IF BOTH the STATEMENT (S1) and its CONVERSE (S1) are NOT true, KELLY is CORRECT (takes both sets of opposite angles
G.1.C (with process G.7.G) (MC, SA)
Use deductive reasoning to prove that a valid geometric statement is true.
Synthesize information to draw conclusions and evaluate the arguments and conclusions of others.

35. **..B**
G.3.A (ADD ON)
Know, explain, and apply basic postulates and theorems about triangles and the special lines, line segments, and rays associated with a triangle.

36. **…A**
G.1.D
Write the converse, inverse, and contra-positive of a valid proposition and determine their validity.

37. **… parallelogram**
G.3.F (MC, CP)
Know, prove, and apply basic theorems about parallelograms.

38. **..A**
G.1.F (MC)
Distinguish between definitions and undefined geometric terms and explain the role of definitions, undefined terms, postulates (axioms), and theorems.

39. **… D**
G.1.F (MC)
Distinguish between definitions and undefined geometric terms and explain the role of definitions, undefined terms, postulates (axioms), and theorems.

40. **…D**
G.1.E (MC)
Identify errors or gaps in a mathematical argument and develop counterexamples to refute invalid statements about geometric relationships.

Geometry Practice Test Version B (BY TOPIC)

Logic & Reasoning **6-8 items (6)**

G.1.C, G.1.D, G.1.E, G.1.F

1. Determine the converse of the given statement.
If the table top is rectangular, then its diagonals are congruent.
Which is the converse of this statement?

- ◯ A. If a table top is rectangular, then its diagonals are not congruent
- ◯ B. If the diagonals of a table top are congruent, then it is rectangular.
- ◯ C. If a table top is not rectangular, then its diagonals are not congruent.
- ◯ D. If the diagonals of a table top are not congruent, then it is not rectangular.

2. Identify the error(s) in reasoning in the following proof.

◯ A. $< ABC \cong <$ PRQ; $\overline{BC} \cong \overline{QR}$ & $\overline{AB} \cong \overline{PQ}$	by *Given*
◯ B. $\overline{AB}$ & $\overline{CB}$ form < ABC $\overline{RQ}$ & $\overline{PR}$ form < PRQ	*by Def of Angle*
◯ C△ ABC has vertices A, B & C △ PQR has vertices P, Q & R	by *Def of Triangle*
◯ D. △ABC ≅△ PQR	*by SAS*

3. (2pt) Given a quadrilateral with one set of opposite angles congruent, John says the quadrilateral must be a parallelogram. Kelly says that is not true, it does not HAVE to be a parallelogram. John says we need only check this statement and its converse.

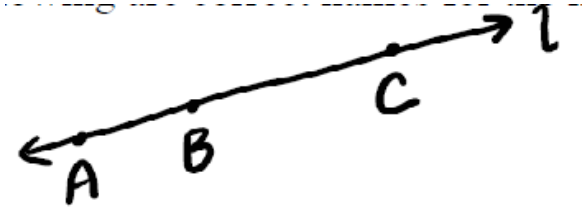
S1: *If a quadrilateral is a parallelogram, then at least one set of its opposite angles are congruent.*

S2: *If at least one set of opposite angles of a quadrilateral are congruent, then it is a parallelogram*

Check these two statements for truth and decide if John or Kelly is right.

4. All of the following are correct names for the line drawn below *except:*

- ◯ A. l
- ◯ B. $\overleftrightarrow{AB}$
- ◯ C $\overleftrightarrow{BC}$
- ◯ D. $\overleftrightarrow{A}$



5. Given the statement: if p then q, which is the inverse:

- ◯ A. If not p, then not q
- ◯ B. if not q, then not p
- ◯ C if q, then p
- ◯ D if p, then not q

6. Identify an example of an undefined term

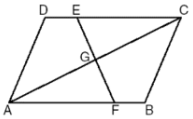
- ◯ A… a point
- ◯ B.. collinear points
- ◯ C.. non-collinear points
- ◯ D.. non-coplanar points

Proving and Applying Properties of 2-Dimensional Figures: 21-24 items (21)
G.3.A, G.3.B, G.3.C, G.3.D, G.3.E, G.3.F, G.3.G

7. A parallelogram must be a rectangle if its diagonals :

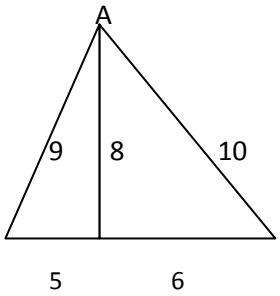
- A. bisect each other
- B. bisect the angles to which they are drawn
- C. are perpendicular to each other.
- D. are congruent

8. In parallelogram ABCD, $\overline{DE} \cong \overline{BF}$
Then △ EGC ≅ △ FGA by:

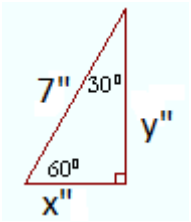


9. Which angle has a cosine of $\frac{3}{5}$?

- A. < ADC
- B. < CAD
- C. < ABC
- D. < CBA



10. Given the triangle below, what is the length of x? (round to nearest 0.1")

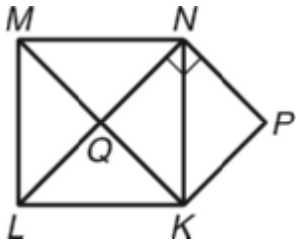


11. The angles of a triangle are in the ratio 1:3:5. What is the measure, in degrees, of the largest angle?

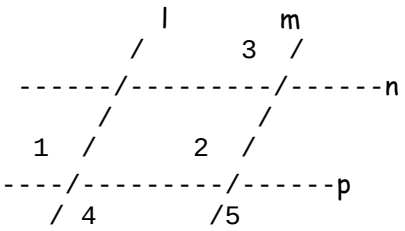
- A. 20°
- B. 30°
- C. 60°
- D. 100°

12. *KLMN* is a square and $\overline{LN} \perp \overline{NP}$.
Which statement can be proved?

- A $\triangle KPN \cong \triangle KQN$
- B $\overline{PN} \| \overline{KM}$
- C. KQ = PN
- D. KP = $\frac{1}{2}$LN



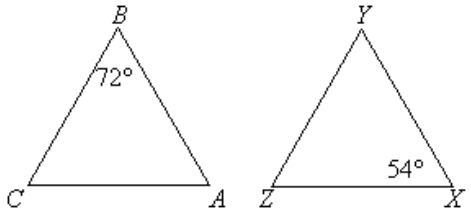
13. Given: <1 ≅ <2, <3 ≅ <4
Which statement MAY NOT be true?



- A. *line l || line m*
- B < 1 ≅ < 3
- C. *the opposite angles of the quadrilateral formed are two pairs of congruent angles*
- D. *quadrilateral formed must be a rectangle*

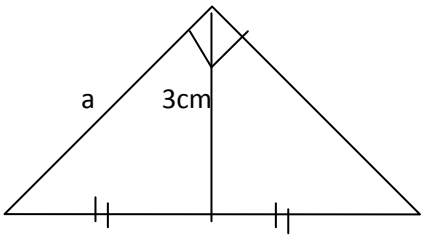
14. Triangle *ABC* and triangle *XYZ* are congruent isosceles triangles. What is the measure of angle *A*?

- A. 8°
- B. 54°
- C. 72°
- D. 180°



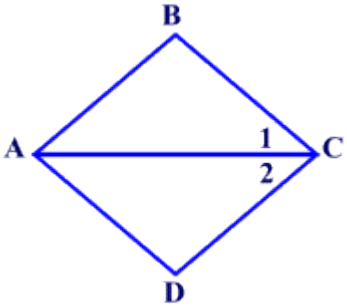
15. Maria is flying a kite on the beach. She holds the end of the string 4 feet above ground level and determines the angle of elevation of the kite to be 54◦. If the string is 70 feet long, how high is the kite above the ground to the *nearest foot*?

16. Given an isosceles triangle with vertex angle 90°. You drop a line segment from the vertex to the opposite side, to intersect at the midpoint. The segment you drew has a length of 3cm. What is the length of side a?



- ○ A. $\frac{\sqrt{3}}{2}$
- ○ B. $\sqrt{3}$
- ○ C. 3
- ○ D. $3\sqrt{2}$

17. What is the missing reason?



Given: $\overline{BC} \cong \overline{CD}$ AND $\overline{AC}$ ***bisects*** $< BCD$

Prove: △ABC ≅ △ADC

Statement		*Reason*	
$\overline{BC} \cong \overline{CD}$	*1. Given*	○ A.	CPCTC
$\angle 1 \cong \angle 2$	*2.* #17	○ B.	Definition of congruent
$\overline{AC} \cong \overline{AC}$	*3. Reflexive Property (a quantity is congruent to itself)*	○ C.	For two congruent segments, their adjacent angles are congruent.
$\Delta ABC \cong \Delta ADC$	*4. (SAS) If two sides and the included angle of one triangle are congruent to the corresponding parts of a second triangle, the triangles are congruent.*	○ D.	An angle bisector is a ray whose endpoint is the vertex of the angle and divides the angle into two congruent angles.

18. Two joggers run 8 miles north and then 5 miles west. What is the shortest distance, to the *nearest tenth of a mile*, they must travel to return to their starting point?

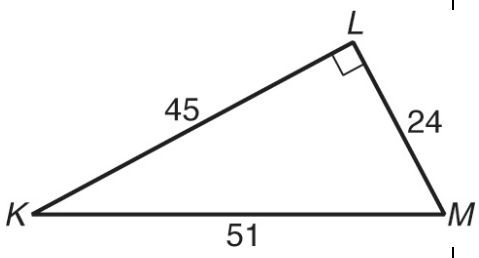
19. If both pairs of opposite angles of a quadrilateral are congruent, the quadrilateral MUST be a:

20. What is the length of the altitude to the hypotenuse in a right triangle if this altitude divides the hypotenuse into segments of lengths 8 millimeters and 18 millimeters?

- A. 12 mm
- B 13 mm
- C 26 mm
- D. 36 mm

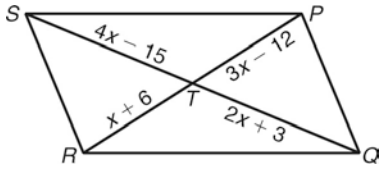
21. What is tan <K?

- A. $\frac{8}{17}$
- B. $\frac{15}{17}$
- C. $\frac{8}{15}$
- D. $\frac{15}{8}$



22. *PQRS* is a parallelogram. Find *x*.

- A. X=3
- B X=7
- C. X=9
- D. X=15

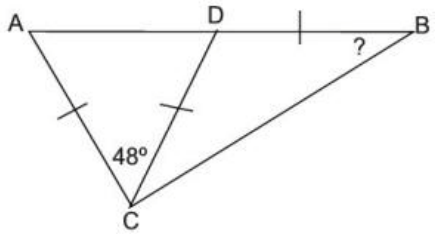


23. Which option below is not used as a reason in geometric proofs:

- A. Given
- B Prove
- C. Definition
- D. Theorem

24. In the diagram below $\overline{AC} \cong \overline{DC} \cong \overline{DB}$.

If the *m*<*ACD* = 48, find the *m*<*B*.



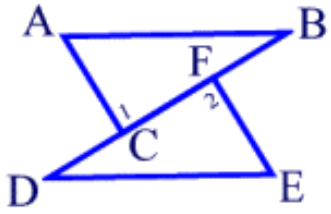
25. Which of the following sets of numbers could represents the lengths of the sides of a right triangle?

- A. {8,10,12}
- B. {25, 31, 40}
- C. {16, 30, 34}
- D. {19, 20, 22}

26. Questions # 26 & #27 below…..

Given $\overline{AC} \cong \overline{EF}$; $\overline{AC} \perp \overline{DB}$; $\overline{EF} \perp \overline{DB}$

Prove: < B ≅ < D



1) $\overline{AC} \perp \overline{DB}$; $\overline{EF} \perp \overline{DB}$ $\overline{AC} \cong \overline{EF}$; $\angle A \cong \angle E$	1) GIVEN
2) #26	2) Perpendicular lines meet to form right angles
3) $\Delta ABC \cong \Delta EDF$	3) ASA
4) $\angle B \cong \angle D$	4) #27

27.

26 Which is the missing statement?

- A. < B ≅< D
- B. <1 ≅< 2
- C. <A & < E are RighT Angles
- D. < 1 & < 2 are Right Angles

#27 Which is the missing reason?

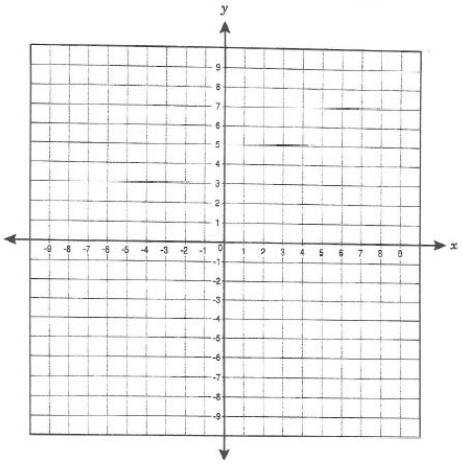
- A. Vertices are ≅
- B. CPCTC
- C. Definition of Congruent
- D. Perpendicular lines make triangles congruent

Version B – By TOPIC **Figures in a coordinate Plane, and Measurement** **7-9 items (7)**

5-8 MC 1-3 CP 0-1 SA

G.4.B, G.4.C, G.6.E, G.6.F

28. Three vertices of a square have coordinates (3,1), (4, -4) and (-1, -5). The diagonals of the square intersect at point Q. Determine the coordinates of point Q. You may use the blank grid to help determine the solution.



29. There are 5 horses on 12 acres of land.

1 acre = 43,560 square feet

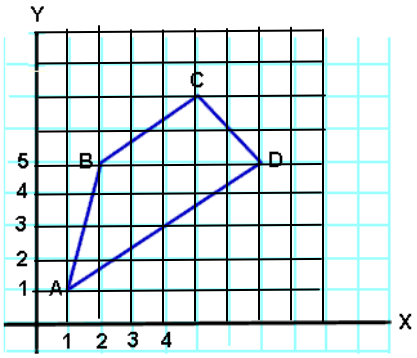
What is the mean number of square **yards** per horse?

- A. 8,712 square yards
- B. 11,616 square yards
- C. 34,848 square yards
- D. 104,544 square yards

30. (*2 pt response)*

Given: A(1,1), B(2, 5), C(5, 7), D(7, 5)

Prove ABCD is a trapezoid.



31. The coordinates of the vertices of parallelogram *ABCD* are $A(-3,2)$, $B(-2,-1)$, $C(4,1)$, and $D(3,4)$. The slopes of which line segments could be calculated to show that *ABCD* is a rectangle?

- A. $\overline{AB}$ and $\overline{DC}$
- B. $\overline{AB}$ and $\overline{BC}$
- C. $\overline{AD}$ and $\overline{BC}$
- D. $\overline{AC}$ and $\overline{BD}$

32. *(2pt response)*

" If a measurement made with a metric ruler is 5.6 cm and the ruler has a precision of 0.1 cm, then the measurement is 5.6 $\pm$ 0.05 cm, or from 5.55 cm to 5.65 cm. Any measurements within this range are 'tolerated' or perceived as correct."

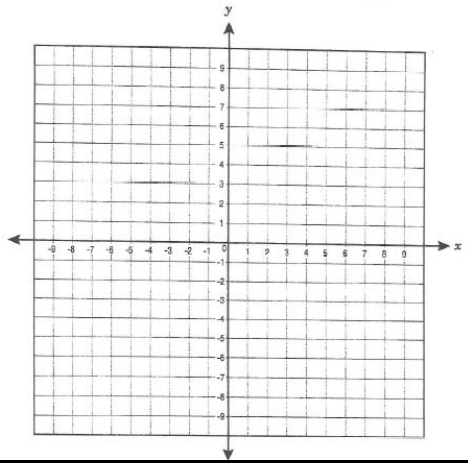
Explain why you might use this degree of precision in measuring, and what is meant by the ruler having "*a precision of 0.1cm".*

33. Martina has a calculator box that has a volume of 29 cubic inches.

1 inch = 2.54 centimeters

Determine the volume of the calculator box to the nearest cubic centimeter.

34. Given a line with y-intercept(0,4) and x-intercept (3,0), find the area of the square with one corner on the origin and the opposite corner on the line described above.



- A. about 2 sq units
- B… about 2.5 sq units
- C.. about 3.5 sq units
- D… about 12 sq units

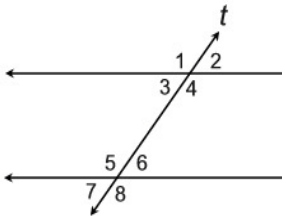
GEOMETRY: Content Specific

6 total items

3-5 MC 1-3 CP 0 SA

G.1.A, G.2.A, G.2.B, G.2.C, G.2.D, G.3.H, G.3.I, G.3.J, G.3.K, G.4.A, G.4.D, G.5.A, G.5.B, G.5.C, G.5.D, G.6.A, G.6.C, G.6.D

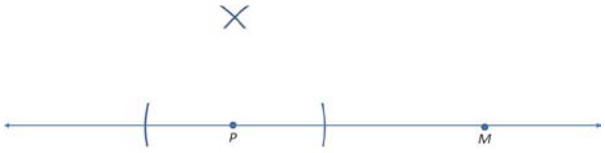
35. In the diagram below, lines *a* and *m* are parallel and are cut by transversal *t*. Which two angles are not always congruent?



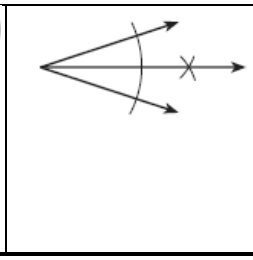
- A. <4 and <6
- B. <1 and <8
- C. <4 and <5
- D. <2 and <3

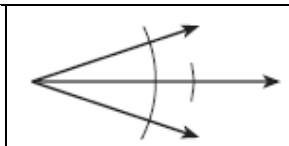
36. Given line $\overleftrightarrow{PM}$, the drawing shows the beginning steps of a geometric construction. Which construction is illustrated here?

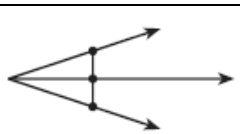
- A. A perpendicular bisector of line *PM*.
- B. A line parallel to line *PM* through point *P*.
- C. A line perpendicular to a line *PM* at point *M*.
- D. A line perpendicular to line *PM* at point *P*.

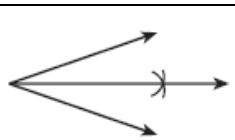


37. Which diagram below shows a correct mathematical construction using only a compass and a straightedge to bisect an angle?

A 

B 

C 

D 

38. Which construction represents the center of a circle that is inscribed in a triangle?

A. The intersection of the three altitudes of the triangle..

B. The intersection of the three medians of the triangle.

C. The intersection of the angle bisectors of each angle of the triangle.

D. The intersection of the perpendicular bisectors of each side of the triangle.

39. When finished with the construction for "Copy an Angle", segments are drawn connecting where the arcs cross the sides of the angles. What method proves these two triangles to be congruent?

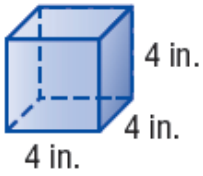
A. ASA

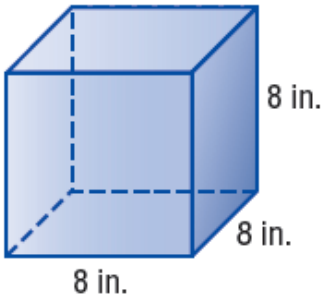
B SSS.

C. SAS

D. AAS

40. What happens to the surface area of a cube if the edges are doubled?





ANSWER KEY

<table>
<tr><td colspan="2">Logic & Reasoning 6-8 itmes (8)
5-8MC 0 CP 0-1 SA
G.1.C(MC, SA), G.1.D(MC, SA) G.1.E (MC), G.1.F</td></tr>
<tr><td>1. …B
G.1.D (MC, SA)
Write the converse, inverse, and contra-positive of a valid proposition and determine their validity.</td><td>2. …D
G.1.E (MC)
Identify errors or gaps in a mathematical argument and develop counterexamples to refute invalid statements about geometric relationships.</td></tr>
<tr><td>3. (2pt)
SINCE BOTH the STATEMENT are NOT true, Kelly is correct
G.1.C (with process G.7.G) (MC, SA)
Use deductive reasoning to prove that a valid geometric statement is true.
Synthesize information to draw conclusions and evaluate the arguments and conclusions of others.</td><td>4. … D
G.1.F (MC)
Distinguish between definitions and undefined geometric terms and explain the role of definitions, undefined terms, postulates (axioms), and theorems.</td></tr>
<tr><td>5. …A
G.1.D
Write the converse, inverse, and contra-positive of a valid proposition and determine their validity.</td><td>6. ..A
G.1.F (MC)
Distinguish between definitions and undefined geometric terms and explain the role of definitions, undefined terms, postulates (axioms), and theorems.</td></tr>
<tr><td colspan="2">Proving and Applying Properties of 2-Dimensional Figures: 21-24 items
15-19MC, 2-4 CP, 1-3 SA
G.3.A (MC, SA), G.3.B (MC,SA), G.3.C (MC, CP) , G.3.D (MC, CP), G.3.E (MC, CP), G.3.F (MC, CP) , G.3.G (MC, CP)</td></tr>
<tr><td>7. …D
G.3.F (MC, CP)
Know, prove, and apply basic theorems about parallelograms.</td><td>8.
G.3.B (MC, SA)
Determine and prove triangle congruence, triangle similarity, and other properties of triangles.</td></tr>
<tr><td>9. …A
G.3.E (MC, CP)
Solve problems involving the basic trigonometric ratios of sine, cosine, and tangent.</td><td>10. …3.5”
G.3.C (MC, CP)
Use the properties of special right triangles (30°–60°–90° and 45°–45°–90°) to solve problems.</td></tr>
<tr><td>11. …D
G.3.A (MC, SA)
Know, explain, and apply basic postulates and theorems about triangles and the special lines, line segments, and rays associated with a triangle.</td><td>12.
G.3.G (MC, CP)
Know, prove, and apply theorems about properties of quadrilaterals and other polygons.</td></tr>
<tr><td>13. …D
G.3.F
Know, prove, and apply basic theorems about parallelograms</td><td>14. …B
G.3.A (MC, SA)
Know, explain, and apply basic postulates and theorems about triangles and the special lines, line segments, and rays associated with a triangle</td></tr>
<tr><td>15. …61ft
G.3.E
Solve problems involving the basic trigonometric ratios of sine, cosine, and tangent.</td><td>16. …D
G.3.C (MC, CP)
Use the properties of special right triangles (30°–60°–90° and 45°–45°–90°) to solve problems.</td></tr>
<tr><td colspan="2">17. ….D
G.3.B</td></tr>
</table>

Determine and prove triangle congruence, triangle similarity, and other properties of triangles.

18. **….. 9.4 miles**
G.3.D (MC, CP)
Know, prove, and apply the Pythagorean Theorem and its converse.

19. **… parallelogram**
G.3.F (MC, CP)
Know, prove, and apply basic theorems about parallelograms.

20. ….A
G.3.B
Determine and prove triangle congruence, triangle similarity, and other properties of triangles.

21. **…C**
G.3.E (MC, CP)
Solve problems involving the **basic trigonometric** ratios of sine, cosine, and **tangent**.

22. …C
G.3.F (MC, CP)
Know, prove, and apply basic theorems about parallelograms.

23. **..B**
G.3.A (ADD ON)
Know, explain, and apply basic postulates and theorems about triangles and the special lines, line segments, and rays associated with a triangle.

24. (*2pts)*
(1pt – found left isosceles @66 ea,*
then subt to find vertex, then calc to find answer)
…33*
G.3.B (MC, SA)
Determine and **prove** triangle congruence, triangle similarity, and other **properties of triangles**

25. **…C**
G.3.D (MC, CP)
Know, prove, and apply the Pythagorean Theorem and its converse.

26. **…D**
G.3.B
Determine and prove triangle congruence, triangle similarity, and other properties of triangles.

27. **..B**
G.3.B
Determine and prove triangle congruence, triangle similarity, and other properties of triangles.

Figures in a coordinate Plane, and Measurement

5-8 MC 1-3 CP 0-1 SA **7-9 Total items (37) 7-9 pts (40)**

G.4.B (MC, CP), G.4.C(_MC_, SA) , G.6.E (__, SA), G.6.F (MC, cp)

28. **…(1, -2)**
G.4.B (MC, CP)
Determine the coordinates of a point that is described geometrically.

29. …**C**
G.6.F (MC, CP)
Solve problems involving **measurement conversions within** and between **systems**, including those involving derived units, and analyze solutions in terms of reasonableness of solutions and appropriate units.

30. *(2pt response)*
… BC || AD (slopes)….. AB NOT || CD (slopes)
G.4.C (MC, SA)
Verify and apply properties of triangles and quadrilaterals in the coordinate plane.

31. …B
G.4.B (MC, CP)
Determine the coordinates of a point that is described geometrically.

32. *(2pt response)*
Examples only….
you might be measuring a section of pipe and need it measured to the nearest 1/10th of a centimeter
The precision of 0.1cm means it will be accurate within 1/10 cm (1/20 cm either way)
G.6.E (MC, SA)
Use different degrees of precision in measurement, explain the reason for using a certain degree of precision, and apply estimation strategies to obtain reasonable measurements with appropriate precision for a given purpose.

33.
…475 cc
G.6.F (MC, CP)
Solve problems involving measurement conversions within and between sy stems, including those involving derived units, and analyze solutions in terms of reasonableness of solutions and appropriate units.

34. **…C**
G.6.F (MC, CP)
Solve problems involving measurement conversions within and between sy stems, including those involving derived units, and analyze solutions in terms of reasonableness of solutions and appropriate units.

GEOMETRY: Content Specific

6 total items(5)

3-5 MC 1-3 CP 0 SA

G.1.A, G.2.A, G.2.B, G.2.C, G.2.D, G.3.H, G.3.I, G.3.J, G.3.K, G.4.A, G.4.D, G.5.A, G.5.B, G.5.C, G.5.D, G.6.A, G.6.C, G.6.D

35. **..A** G.2.B (MC, CP) Know, prove, **and apply theorems about angles**, including angles that arise from **parallel lines intersected by a transversal.**	36. …D G.2.C (MC) **Explain** and perform **basic compass and straightedge constructions** related to parallel and **perpendicular** lines.
37. .A G.2.C (MC) Explain and perform **basic compass and straightedge constructions** related to parallel and perpendicular lines.	
38. **… …C** G.3.I (MC) Explain and perform constructions related to the circle.	39. …C G.2.C (MC) **Explain** and perform **basic compass and straightedge constructions** related to parallel and **perpendicular** lines.
40. **….surface area is 4x bigger (2x2)** G.6.D (MC, CP) Predict and verify the effect that changing one, two, or three linear dimensions has on perimeter, area, volume, or surface area of two- and three-dimensional figures	