CST Geometry Practice Problems

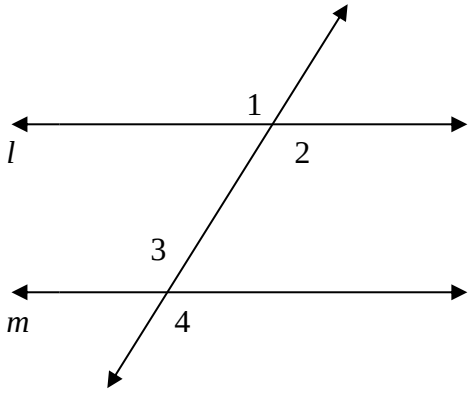
1. Which of the following best describes deductive reasoning?

A using logic to draw conclusions based on accepted statements
B accepting the meaning of a term without definition
C defining mathematical terms to correspond with physical objects
D inferring a general truth by examining a number of specific examples

2. Jane sees three girls with blond hair wearing jeans, she concludes that all blonds wear jeans. This is an example of what kind of reasoning?

A deductive reasoning
B indirect proof
C counterexample
D inductive reasoning

3. In the diagram below, $\angle 1 \cong \angle 4$



Which of the following conclusions does *not* have to be true?

A $\angle 3$ and $\angle 4$ are supplementary angles.
B Line *l* is parallel to line *m*.
C $\angle 1 \cong \angle 3$
D $\angle 2 \cong \angle 3$

4. Theorem: A triangle has at most one obtuse angle.
Eduardo is proving the theorem above by contradiction. He began by assuming that in ΔABC, $\angle A$ and $\angle B$ are both obtuse. Which theorem will Eduardo use to reach a contradiction?

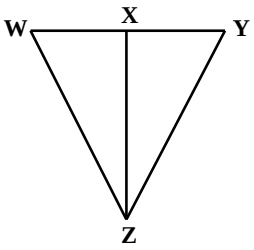
A If two angles of a triangle are equal, the sides opposite the angles are equal.
B If two supplementary angles are equal, the angles each measure 90˚.
C The largest angle in a triangle is opposite the longest side.
D The sum of the measures of the angles of a triangle is 180˚.

5. Use the proof to answer the question below.

Given: $WZ = ZY$;

X is the midpoint of $\overline{WY}$.

Prove: $\Delta WZX \cong \Delta YZX$



	Statement	Reason
1.	$WZ = ZY$; X is the midpoint of $\overline{WY}$	1. Given
2.	$WX = YX$	2 Definition of Midpoint
3.	$ZX = ZX$	3. Reflexive Property
4.	$\Delta WZX \cong \Delta YZX$	4. ?

What reason can be used to prove that the triangles are congruent?

A AAS
B ASA
C SAS
D SSS

6. "Two *lines in a plane always intersect in exactly one point*."
Which of the following best describes a *counterexample* to the assertion above?
A coplanar lines
B parallel lines
C perpendicular lines
D intersecting lines

7. Which figure can serve as a counterexample to the conjecture below?
If one pair of opposite sides of a quadrilateral is parallel, then the quadrilateral is a parallelogram.

A rectangle
B rhombus
C square
D trapezoid

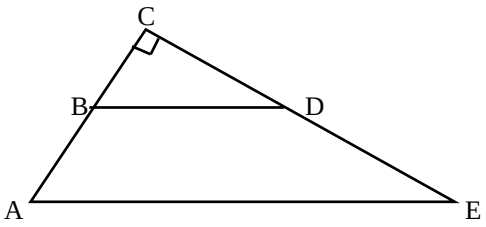
8. Given: *TRAP* is an isosceles trapezoid with diagonals *RP* and *TA*. Which of the following must be true?

A $RP \perp TA$
B $RP \parallel TA$
C $RP \cong TA$
D *RP* bisects *TA*

9. Which triangles must be similar?

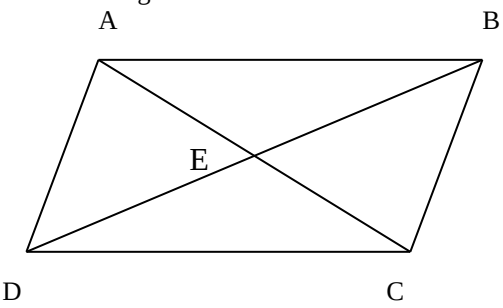
A two obtuse triangles
B two scalene triangles with congruent bases
C two right triangles
D two isosceles triangles with congruent vertex angles

10. Which of the following facts would be sufficient to prove that triangles Δ*ACE* and Δ*BCD* are similar?



A *AB* and *BC* are congruent.
B ∠*ACE* is a right angle.
C *AE* and *BD* are parallel.
D ∠*A* and ∠*E* are congruent

11. Parallelogram *ABCD* is shown below.



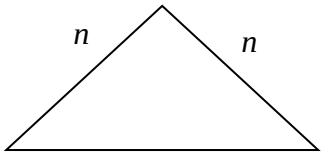
Which pair of triangles can be established to be congruent to prove that ∠*DAB* ≅ ∠*BCD*?

A Δ*ADC* and Δ*BCD*
B Δ*AED* and Δ*BEC*
C Δ*DAB* and Δ*BCD*
D Δ*DEC* and Δ*BEA*

12. If Δ*ABC* and Δ*XYZ* are two triangles such that $\frac{AB}{XY} = \frac{BC}{YZ}$, which of the following would be sufficient to prove the triangles are similar?

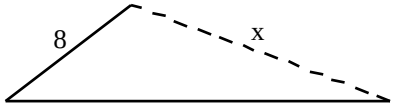
A ∠A ≅ ∠X
B ∠B ≅ ∠Y
C ∠C ≅ ∠Z
D ∠X ≅ ∠Y

13. In the figure below, *n* is a whole number. What is the smallest possible value for *n*?



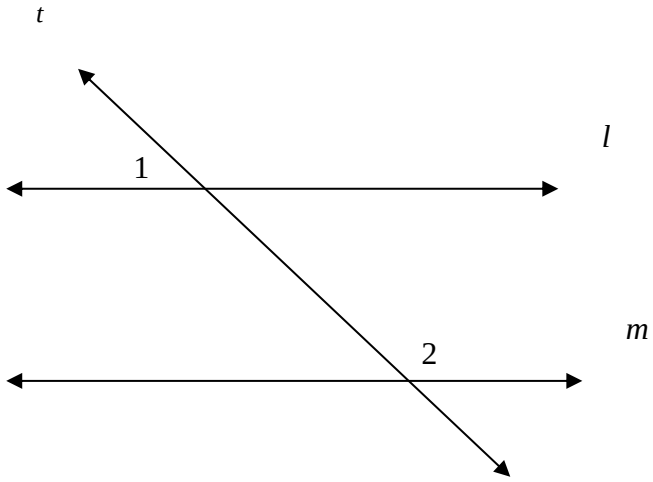
A 1
B 7
C 8
D 14

14. In the figure below, what is the largest possible value for x?



A 6
B 104
C 16
D 25

15. In the accompanying diagram, parallel lines *l* and m are cut by transversal *t*.



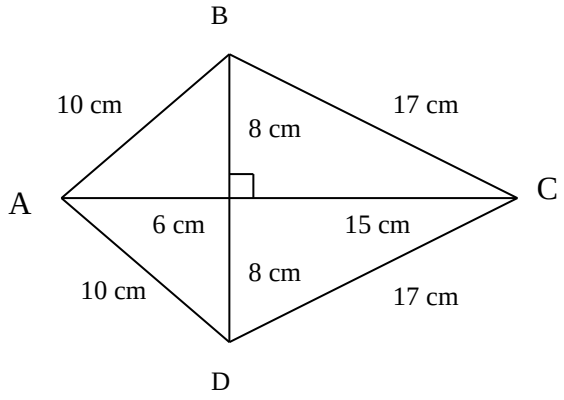
Which statement about angles 1 and 2 *must* be true?

A ∠1 ≅ ∠2.
B ∠1 is the complement of ∠2.
C ∠1 is the supplement of ∠2.
D ∠1 and ∠2 are right angles.

16. Quadrilateral *ABCD* is a parallelogram. If adjacent angles are congruent, which statement must be true?

A Quadrilateral *ABCD* is a square.
B Quadrilateral *ABCD* is a rhombus.
C Quadrilateral *ABCD* is a rectangle.
D Quadrilateral *ABCD* is an isosceles trapezoid.

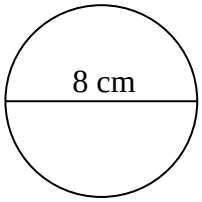
17. Figure ABCD is a kite.



What is the area of figure ABCD, in square centimeters?

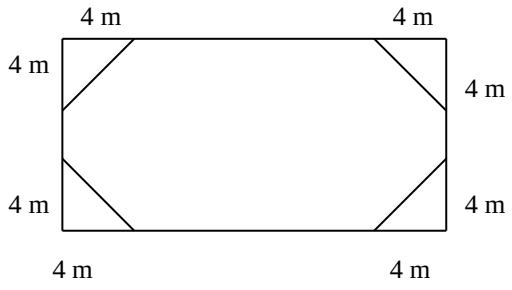
A 120
B 154
C 168
D 336

18. The diameter of a circle is 8cm, what is its circumference?



A 4π cm
B 16π cm
C 8π cm
D $4\pi^2$ cm

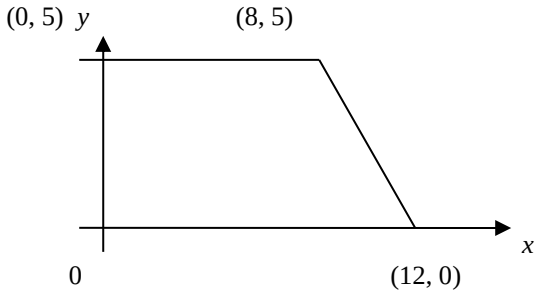
19. The rectangle shown below has length 20 meters and width 10 meters.



If four triangles are removed from the rectangle as shown, what will be the area of the remaining figure?

A 136 m^2
B 144 m^2
C 168 m^2
D 184 m^2

20. What is the area, in square units, of the trapezoid shown below?



A 37.5
B 42.5
C 50
D 100

21. The perimeters of two squares are in a ratio of 4 to 9. What is the ratio between the areas of the two squares?

A 2 to 3
B 4 to 9
C 16 to 27
D 16 to 81

22. A model car is 1/4 the size of the original. It is made of the same materials as the original car. What would the ratio of their weights be?

A 1/16
B 1/8
C 1/64
D 4/16

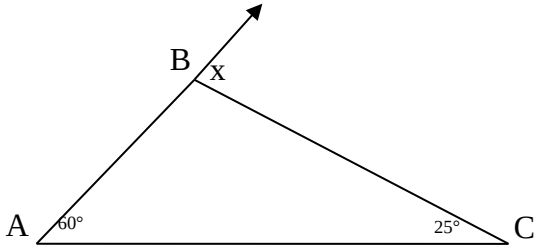
23. Two angles of a triangle have measures of 55˚ and 65˚. Which of the following could *not* be a measure of an exterior angle of the triangle?

A 115°
B 120°
C 125°
D 130°

24. The sum of the interior angles of a polygon is the same as the sum of its exterior angles. What type of polygon is it?

A quadrilateral
B hexagon
C octagon
D decagon

25. What is m $\angle$ x

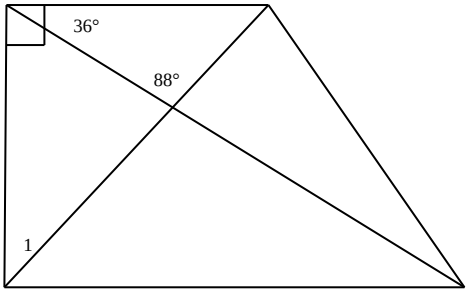


A 35°
B 60°
C 85°
D 95°

26. If the measure of an exterior angle of a regular polygon is 120°, how many sides does the polygon have?

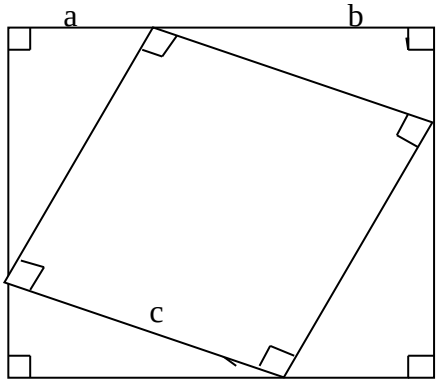
A 3
B 4
C 5
D 6

27. What is m $\angle$ 1?



A 34°
B 56°
C 64°
D 92°

28. A diagram from a proof of the Pythagorean Theorem is pictured below.

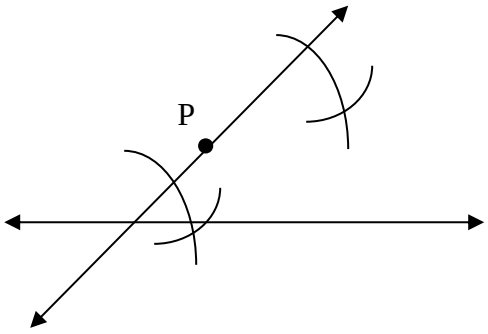


Which statement would *not* be used in the proof of the Pythagorean Theorem?

A The area of a triangle equals $\frac{1}{2}$ ab.
B The four right triangles are congruent.
C The area of the inner square is equal to half of the area of the larger square.
D The area of the larger square is equal to the sum of the areas of the smaller square and the four congruent triangles.

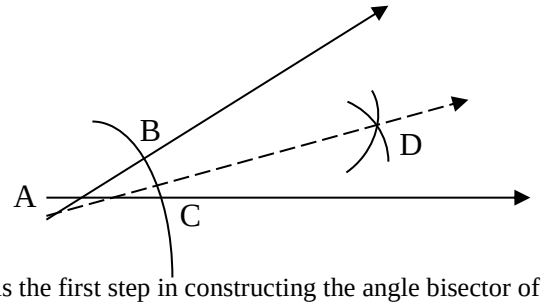
29. A right triangle's hypotenuse has length 5. If one leg has length 2, what is the length of the other leg?
A 3
B $\sqrt{21}$
C $\sqrt{29}$
D 7

30. Marsha is using a straightedge and compass to do the construction shown below.



Which *best* describes the construction Marsha is doing?
A a line through P parallel to line l
B a line through P intersecting line l
C a line through P congruent to line l
D a line through P perpendicular to line l

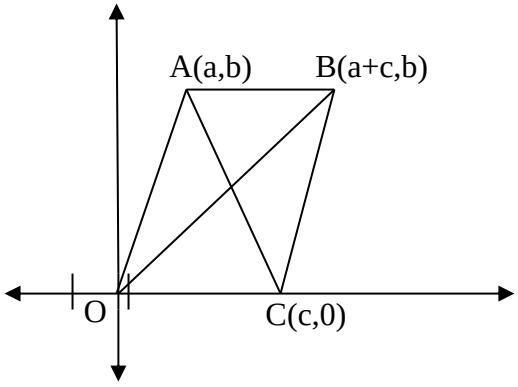
31. Given : angle A



What is the first step in constructing the angle bisector of angle A?

A Draw ray $\overrightarrow{AD}$.
B Draw a line segment connecting points B and C.
C From points B and C, draw equal arcs that intersect at D.
D From point A, draw an arc that intersects the sides of the angle at points B and C.

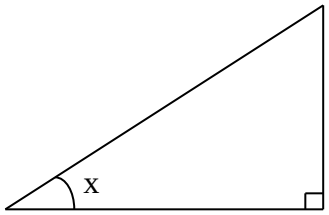
32. Figure $\Delta ABCO$ is a parallelogram.



What are the coordinates of the point of intersection of the diagonals?

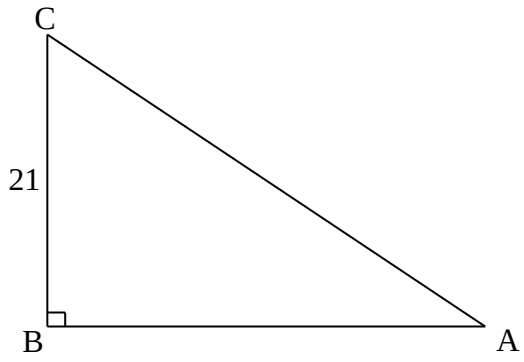
A $\left(\frac{a}{2},\frac{b}{2}\right)$
B $\left(\frac{c}{2},\frac{b}{2}\right)$
C $\left(\frac{a+c}{2},\frac{b}{2}\right)$
D $\left(\frac{a+c}{2},\frac{a+b}{2}\right)$

33. In the figure below, if sin x= $\frac{5}{13}$, what are cos x and tan x?



A cos x= $\frac{12}{13}$ and tan x= $\frac{5}{12}$
B cos x = $\frac{12}{13}$ and tan x $\frac{12}{5}$
C cos x= $\frac{13}{12}$ and tan x= $\frac{5}{12}$
D cos x= $\frac{13}{12}$ and tan x= $\frac{13}{5}$

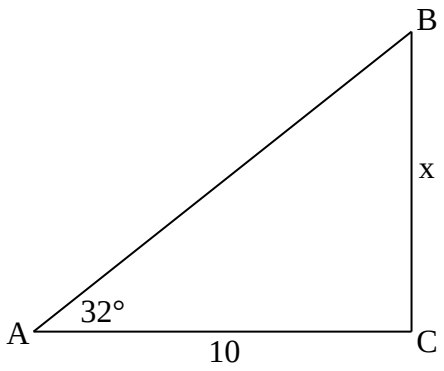
34. In the figure below, sin A= 0.7



What is the length of $\overrightarrow{AC}$?

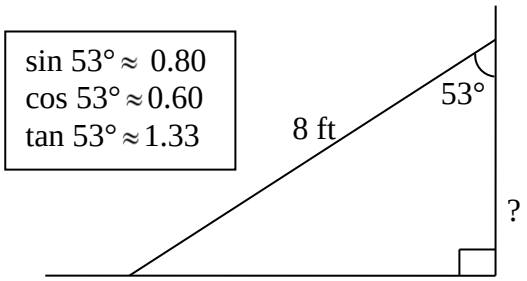
A 14.7
B 21.7
C 30
D 32

35. In the accompanying diagram, m $\angle A$ = 32° and AC= 10. Which equation could be used to find x in ΔABC ?



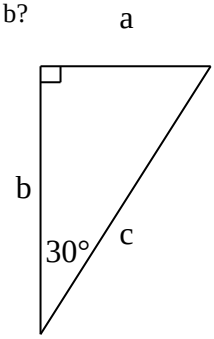
A x= 10sin32°
B x= 10cos32°
C x= 10tan 32°
D x= $\frac{10}{\cos 32°}$

36. The diagram shows an 8-foot ladder leaning against a wall. The ladder makes a 53° angle with the wall. Which is the closest to the distance up the wall the ladder reaches?



A 3.2 ft
B 4.8 ft
C 6.4 ft
D 9.6 ft

37. If a= $3\sqrt{3}$ in the right triangle below, what is the value of b?



A 9
B $6\sqrt{3}$
C $12\sqrt{3}$
D 18

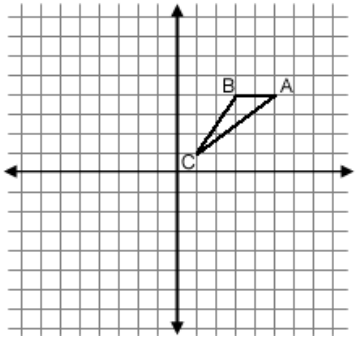
38. A square is circumscribed about a circle. What is the ration of the area of the circle to the area of the square?

A $\frac{1}{4}$
B $\frac{1}{2}$
C $\frac{2}{\pi}$
D $\frac{\pi}{4}$

39. The vertices of ΔABC are A(2,1), B(3,4), and C(1,3). If ΔABC is translated 1 unit down and 3 units to the left to create ΔDEF , what are the coordinates of the vertices of ΔDEF ?

A D(0,1), E(1,2), F(–2,2)
B D(0,–1), E(3,0), F(–2,–2)
C D(–2.2), E(0,3), F(–1,0)
D D(–1,0), E(0,3), F(–2,2)

40. If triangle ABC is rotated 180 degrees about the origin, what are the coordinates of A?



A (–5,–4)
B (–5, 4)
C (–4, 5)
D (–4,–5)