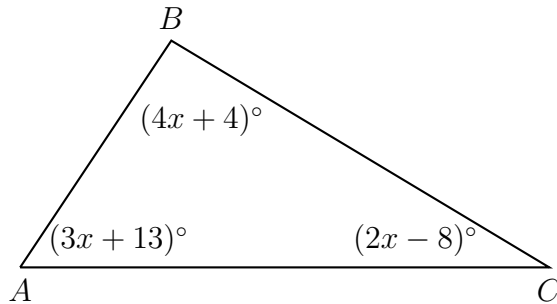


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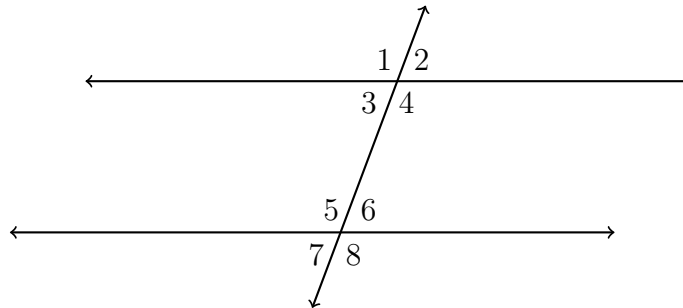
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Take Home Test: Triangles, transformations, proof

1. In $\triangle ABC$ shown below, $m\angle A = (3x + 13)^\circ$, $m\angle B = (4x + 4)^\circ$, and $m\angle C = (2x - 8)^\circ$. What is $m\angle A$?



2. Given two parallel lines and a transversal, as shown below.

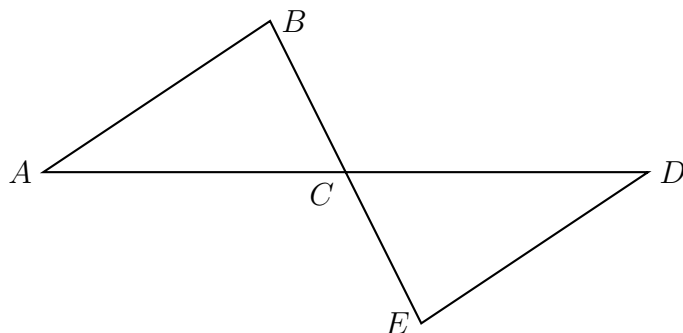


(a) State the angle corresponding with $\angle 6$.

(b) Given $m\angle 3 = 73^\circ$ and $m\angle 5 = (3x - 1)^\circ$. Find x .

(c) In a proof, what reason would justify $\angle 5 \cong \angle 6$? _____

3. Given $\triangle ABC$ and $\triangle DEC$ with $\angle B \cong \angle E$. C is the midpoint of \overline{AD} .
Prove $\triangle ABC \cong \triangle DEC$.



Statement

Reason

1) _____

1) Given

2) _____

2) Given

3) _____

3) Given

4) $\angle BCA \cong \angle ECD$

4) _____

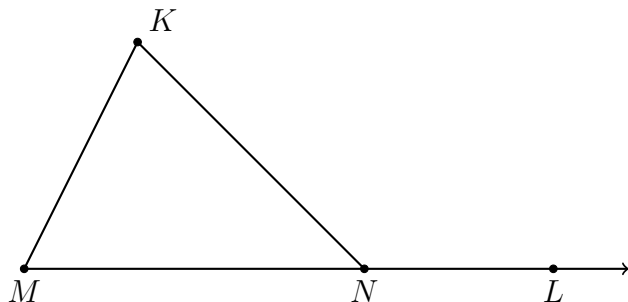
5) _____

5) Definition of a midpoint

6) $\triangle ABC \cong \triangle DEC$

6) _____

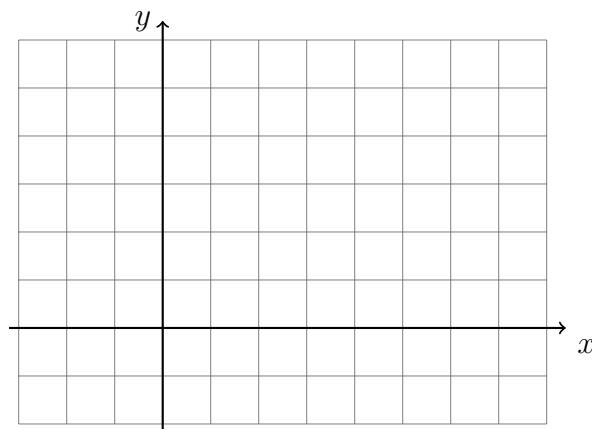
4. Given $\overline{KN} \cong \overline{MN}$ and $m\angle KNL = 108^\circ$. Find $m\angle M$.



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5. On the graph below, draw \overline{AB} , with $A(-1, -1)$ and $B(7, 1)$, labeling the end points. Determine and state the coordinates of the midpoint M of \overline{AB} and mark and label it on the graph.



6. Express the result to *the nearest thousandth*.

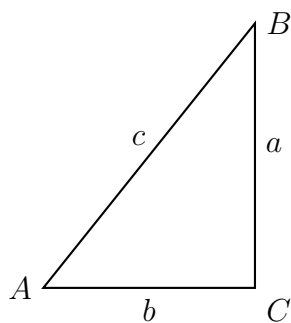
(a) $\sin 42^\circ =$

(c) $\cos 48^\circ =$

(b) $\cos 19^\circ =$

(d) $\sin 71^\circ =$

7. $\triangle ABC$ is shown with $m\angle C = 90^\circ$. The lengths of the triangle's sides are a , b , and c . Express each trigonometric ratio as a fraction of two variables.

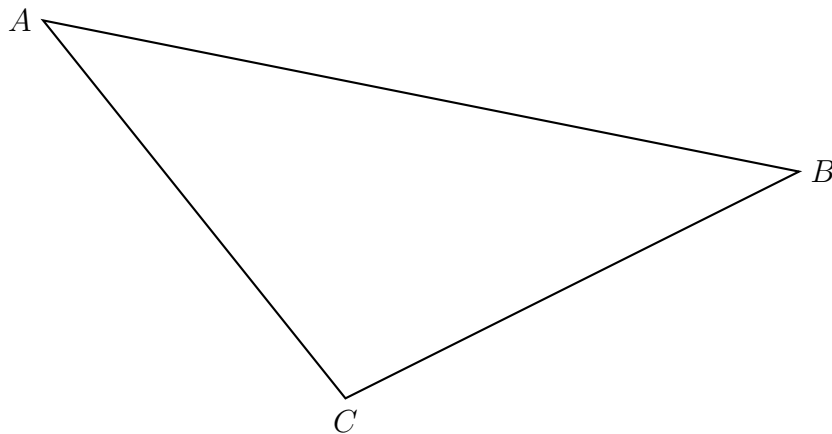


(a) $\sin B =$

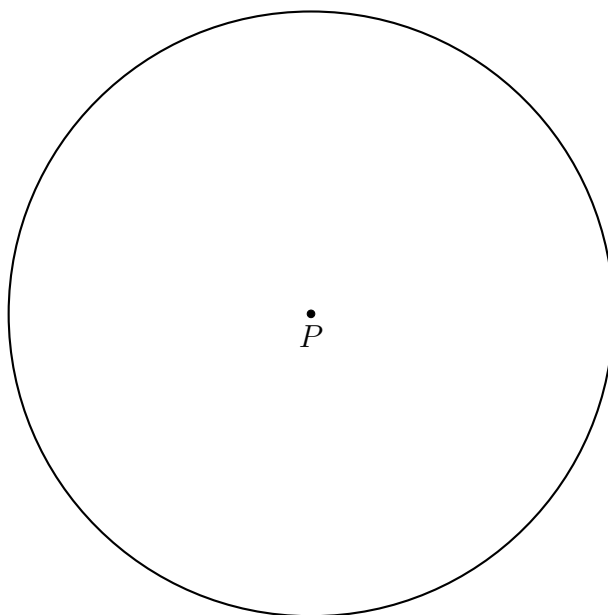
(b) $\cos A =$

- (c) Explain why $\angle A$ and $\angle B$ are complementary.

8. Using a compass and straightedge, construct the median to side \overline{AC} in $\triangle ABC$ below.
(Leave all construction marks.)



9. With a compass and straightedge, construct a regular hexagon inscribed in circle P .
(Leave all construction marks.)



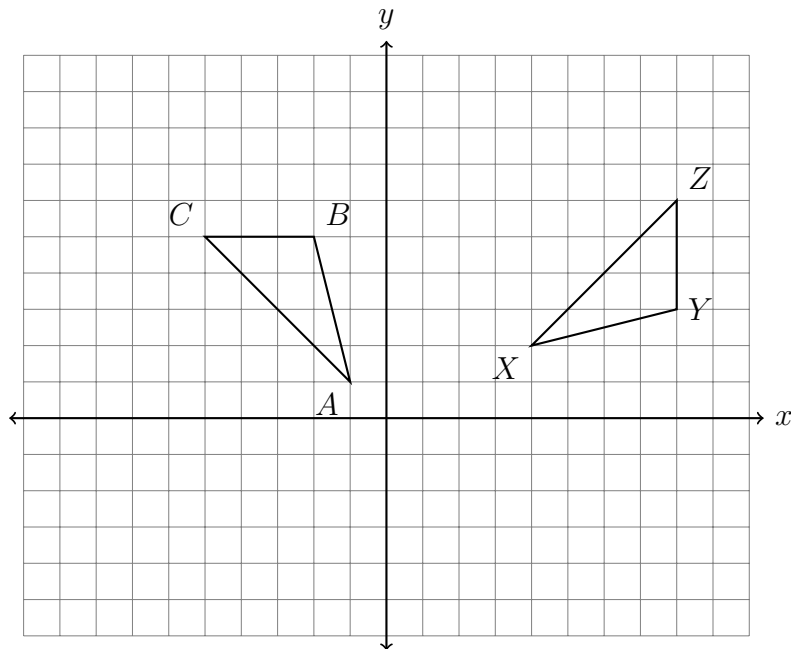
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10. $A(-2, -5)$ is one endpoint of \overline{AB} . The segment's midpoint is $M(4, -1)$. Find the other endpoint, B .
11. The line l has the equation $y = -\frac{3}{4}x + 3$.
- (a) What is the slope of the line k , given $k \parallel l$?
- (b) What is the slope of the line m , given $m \perp l$?
12. Given $P(-3, 9)$ and $Q(3, 1)$, find the length of \overline{PQ} .

13. A translation maps $D(2, 4) \rightarrow D'(-3, 4)$. What is the image of $E(5, -5)$ under the same translation?

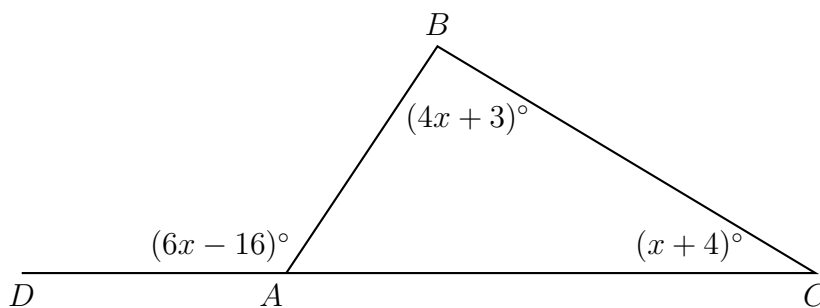
14. The image of triangle ABC after a rotation is $\triangle A'B'C'$. Is the area of the triangle greater, smaller, or the same after the translation? Justify your answer.

15. The triangle ABC , shown below, undergoes two rigid motions carrying it onto triangle XYZ . State the two isometric transformations. (be specific)



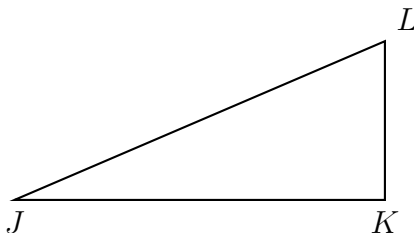
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16. In $\triangle ABC$ shown below, side \overline{AC} is extended to point D with $m\angle DAB = (6x - 16)^\circ$, $m\angle C = (x + 4)^\circ$, and $m\angle B = (4x + 3)^\circ$.

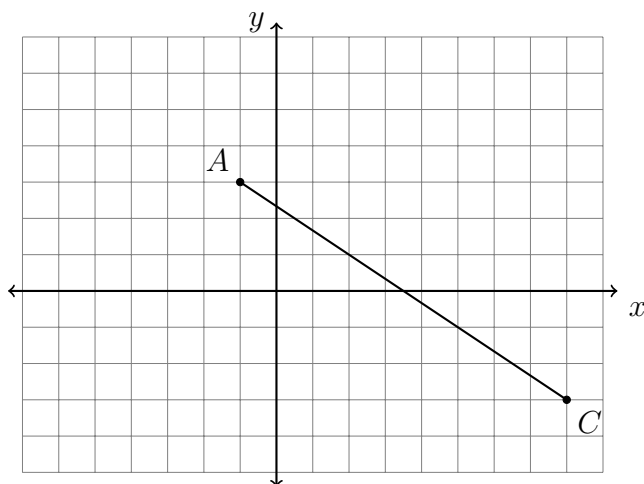


What is $m\angle BAC$?

17. Given right $\triangle JKL$ with $\overline{JK} \perp \overline{KL}$, $JL = 9.7$, $m\angle J = 36^\circ$. Find the length JK , rounded to the nearest thousandth.



18. In the diagram below, \overleftrightarrow{AC} has endpoints with coordinates $A(-1, 3)$ and $C(8, -3)$.

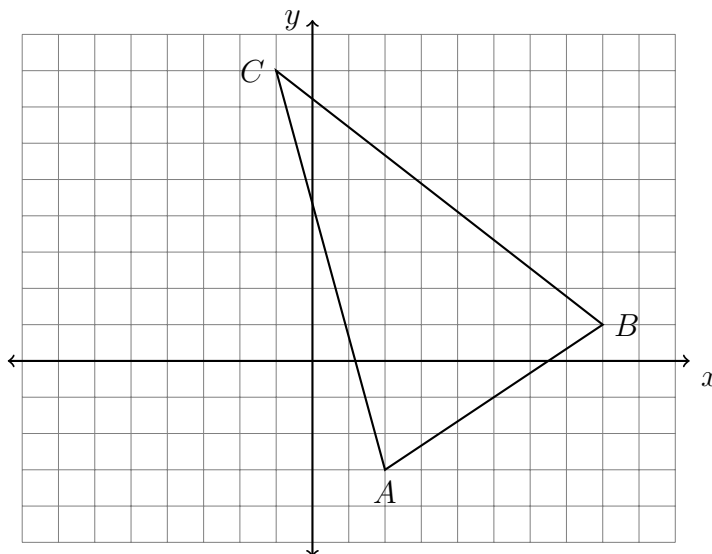


If B is a point on \overline{AC} and $AB:BC = 1:2$, what are the coordinates of B ?

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19. Spicy: Triangle $\triangle ABC$ is graphed on the set of axes below. The vertices of $\triangle ABC$ have the coordinates $A(2, -3)$, $B(8, 1)$, and $C(-1, 8)$.



- (a) Draw an altitude through point C perpendicular to \overline{AB} .
(b) What is the length of the altitude drawn through C ?

- (c) What is the length of the base, AB ?

- (d) Find the area of $\triangle ABC$.