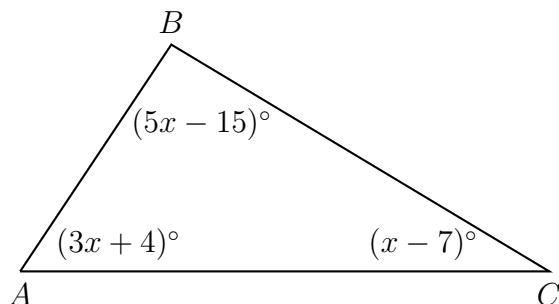


13 December 2018

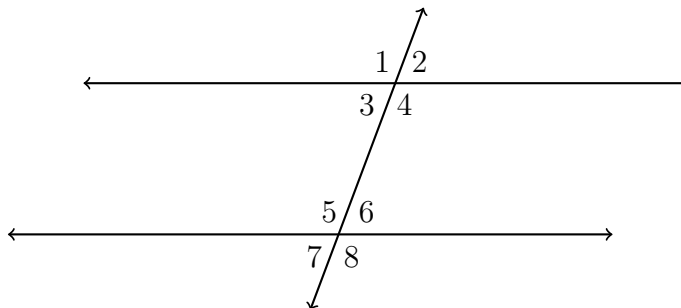
Name:

Test: Triangles, transformations, proof

1. In $\triangle ABC$ shown below, $m\angle A = (3x + 4)^\circ$, $m\angle B = (5x - 15)^\circ$, and $m\angle C = (x - 7)^\circ$. What is $m\angle A$?



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

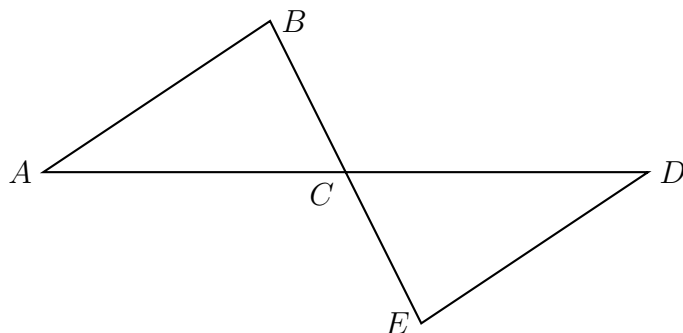


(a) State the angle corresponding with $\angle 5$.

(b) Given $m\angle 3 = 78^\circ$ and $m\angle 5 = 3x^\circ$. Find x .

(c) In a proof, what reason would justify $\angle 3 \cong \angle 6$? _____

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



Statement

Reason

1) _____

1) Given

2) _____

2) Given

3) _____

3) Given

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

4) _____

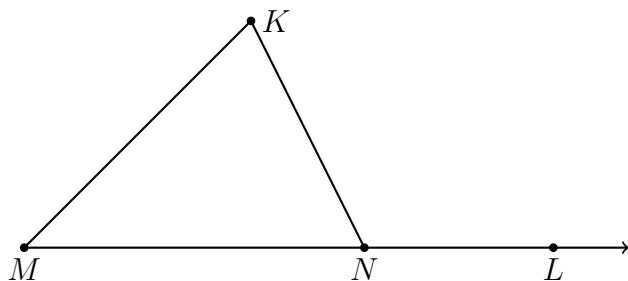
5) _____

5) Definition of a midpoint

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

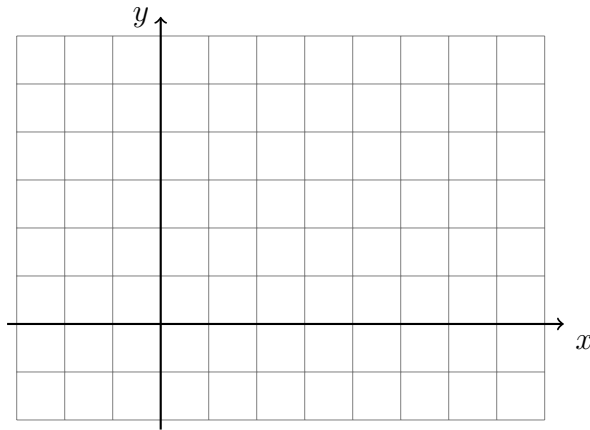
6) _____

4. Given $m\angle K = 38^\circ$ and $m\angle KNL = 111^\circ$. Find $m\angle M$.



Name:

5. On the graph below, draw \overline{AB} , with $A(-2, 1)$ and $B(6, 3)$, 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.

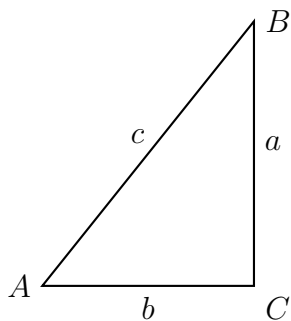
(a) $\sin 60^\circ =$

(c) $\tan 45^\circ =$

(b) $\cos 23^\circ =$

(d) $\sin 81^\circ =$

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.

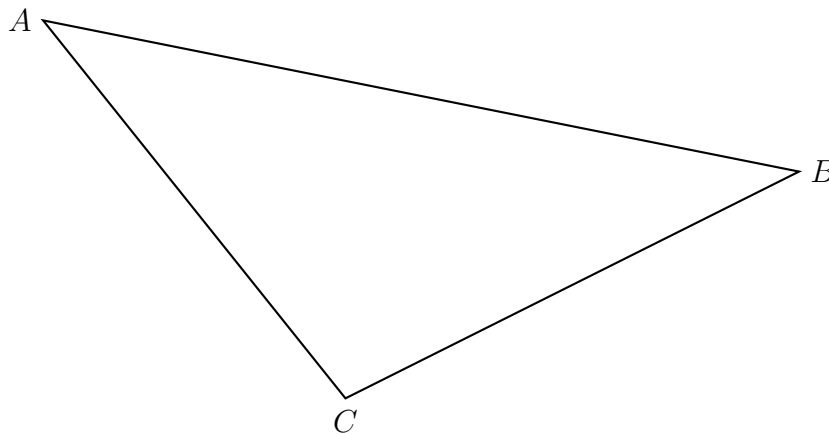


(a) $\sin A =$

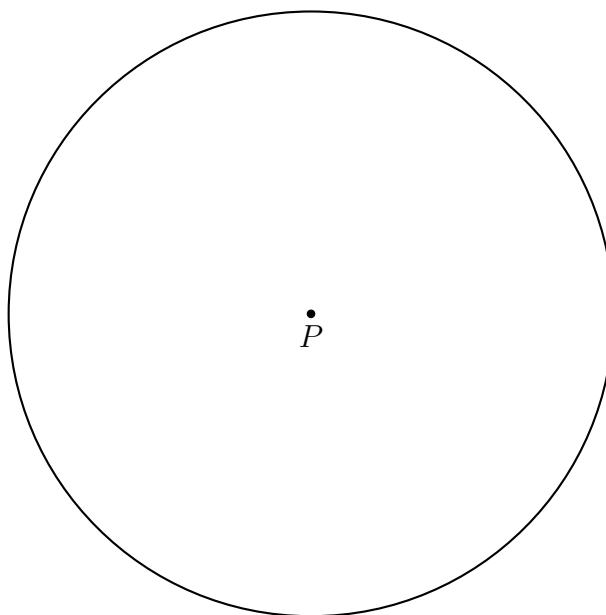
(b) $\cos A =$

(c) $\tan A =$

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



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

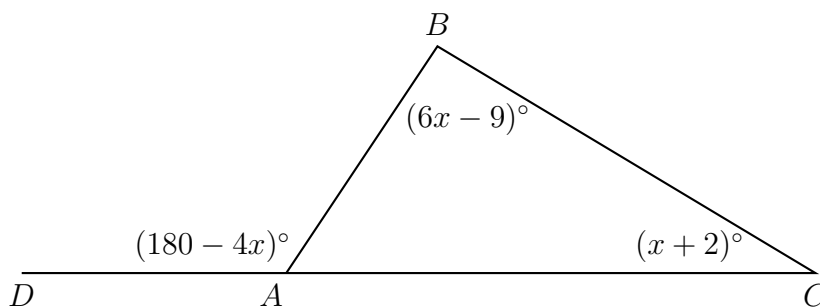


10. $A(3, 1)$ is one endpoint of \overline{AB} . The segment's midpoint is $M(7, 6)$. Find the other endpoint, B .
11. The line l has the equation $y = -\frac{3}{2}x - 7$.
- (a) What is the slope of the line k , given $k \parallel l$?
- (b) What is the slope of the line m , given $m \perp l$?
12. Given $P(-2, 9)$ and $Q(3, -3)$, find the length of \overline{PQ} .

13. Apply the translation $(x, y) \rightarrow (x - 2, y + 4)$ to the point $A(2, -1)$.
14. What is the image of $B(2, 7)$ under a reflection across the x -axis?
15. State the translation that would map $C(-3, 1)$ onto $C'(4, 0)$.
16. A translation maps $D(1, 9) \rightarrow D'(4, 3)$. What is the image of $E(6, -2)$ under the same translation?
17. The image of triangle ABC after a translation is $\triangle A'B'C'$. Is the area of the triangle greater, smaller, or the same after the translation? Justify your answer.

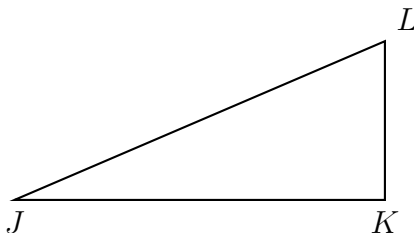
Name:

18. In $\triangle ABC$ shown below, side \overline{AC} is extended to point D with $m\angle DAB = (180 - 4x)^\circ$, $m\angle C = (x + 2)^\circ$, and $m\angle B = (6x - 9)^\circ$.

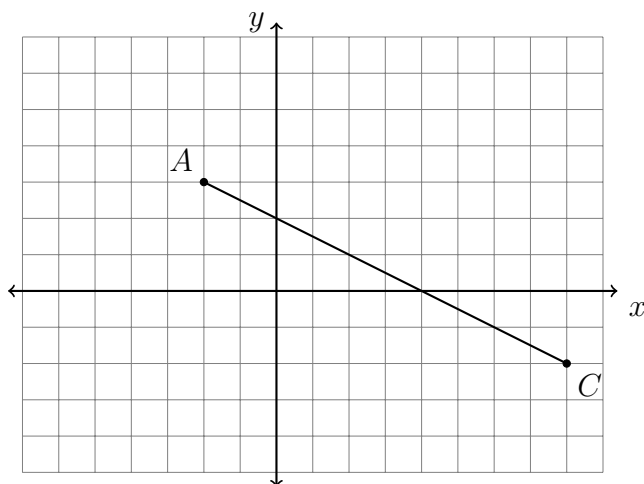


What is $m\angle BAC$?

19. Given right $\triangle JKL$ with $\overline{JK} \perp \overline{KL}$, $JL = 9$, $m\angle J = 32^\circ$. Find the length JK , rounded to the nearest thousandth.



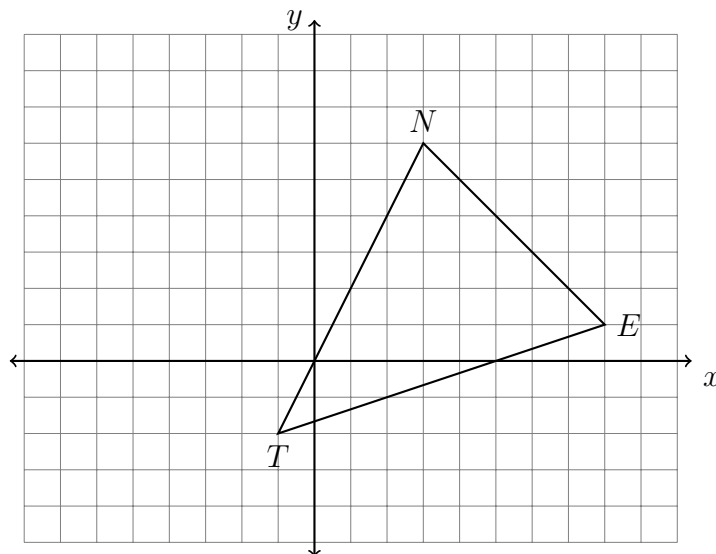
20. Spicy: In the diagram below, \overleftrightarrow{AC} has endpoints with coordinates $A(-2, 3)$ and $C(8, -2)$.



If B is a point on \overline{AC} and $AB:BC = 2:3$, what are the coordinates of B ?

Name:

21. Spicy: Triangle $\triangle DAN$ is graphed on the set of axes below. The vertices of $\triangle DAN$ have the coordinates $T(-1, -2)$, $E(8, 1)$, and $N(3, 6)$.



(a) Draw an altitude through point N perpendicular to \overline{TE} .

(b) What is the length of the altitude drawn through N ?

(c) What is the length of the base, TE ?

(d) Find the area of $\triangle DAN$.