6.12b Exam: Graphing, perpendicular and parallel slopes

1. Graph and label the two equations. Mark their intersection as an ordered pair.

$$y = \frac{3}{4}x - 5$$

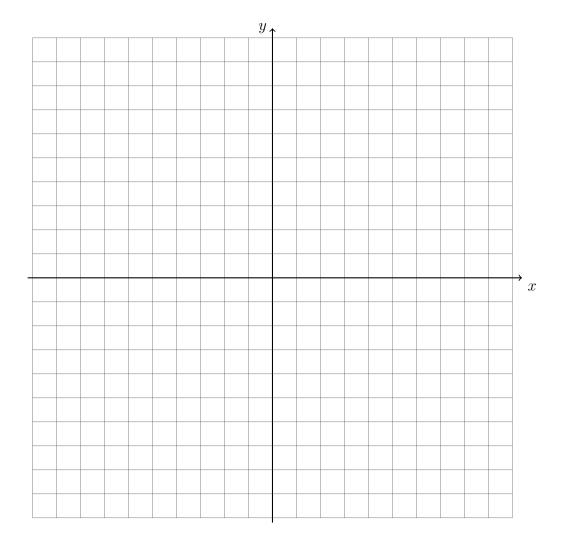
$$y = -x + 2$$

Write down the slopes of the two lines.

$$m_1 =$$

$$m_2 =$$

Are the lines parallel, perpendicular, or neither? Justify your answer using the slopes.

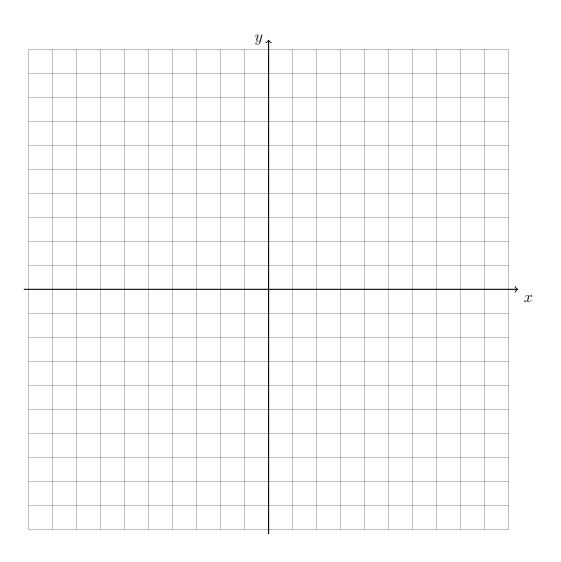


2. Graph and label the two equations. Mark their intersection as an ordered pair.

$$y = -\frac{1}{3}x + 4$$

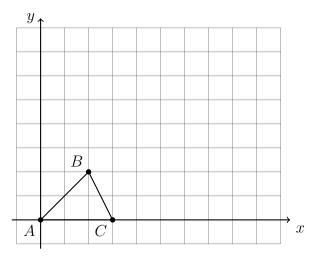
$$y = 3x - 6$$

Are the lines parallel, perpendicular, or neither? Justify your answer using the slopes.



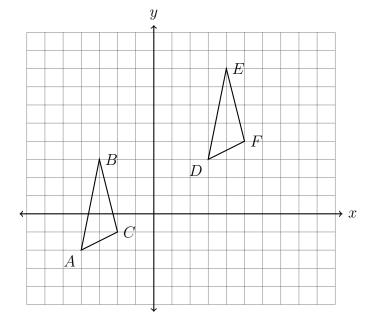
- 3. The line l has the equation $y = -\frac{3}{5}x + 3$.
 - (a) What is the slope of the line k, given $k \parallel l$?
 - (b) What is the slope of the line j, given $j \perp l$?

4. Apply a dilation mapping $\triangle ABC \rightarrow \triangle A'B'C'$ with a factor of k=3 centered at the origin. Draw and label the image on the grid and make a table of the coordinates.

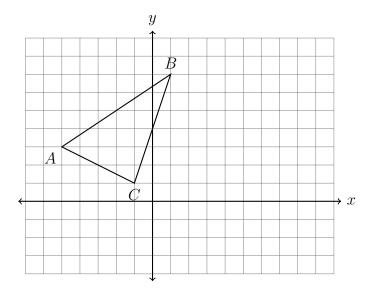


5. Find the image of P(-2,7) after the translation $(x,y) \to (x+5,y-2)$.

6. What transformation maps $\triangle ABC$ onto $\triangle DEF$, shown below? Fully specify the transformation.



7. Translate $\triangle ABC$ to the right six units and down two units. Make a table of the coordinates and plot and label the image on the axes.



- 8. A translation maps $P(-5,3) \to P'(6,1)$. What is the image of Q(1,9) under the same translation?
- 9. A dilation maps triangle KLM onto triangle PQR, with KM=5, LM=4, PR=10.

K L P Q R

 $\label{complete} \mbox{Complete each mapping or equivalence.}$

- (a) $L \rightarrow \underline{\hspace{1cm}}$
- (b) $\angle K \cong \underline{\hspace{1cm}}$
- (c) QR =_____
- 10. Given $\triangle ABC \sim \triangle DEF$. $m \angle A = 33^{\circ}$ and $m \angle B = 66^{\circ}$. Find the measure of $\angle D$.

11. A dilation centered at A maps $\triangle ABC \rightarrow \triangle ADE$. Given the sides of the preimage, $AC=6,\ BC=4,\ AB=8,$ and of DE=10 find the scale factor k and the lengths AD and AE. Then find CE and BD.

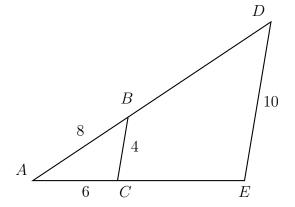


(b)
$$AD =$$

(c)
$$AE =$$

(d)
$$CE =$$

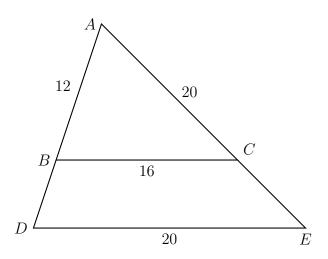
(e)
$$BD =$$



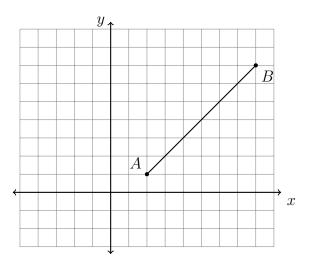
12. Triangle ABC is dilated with a scale factor of k centered at A, yielding $\triangle ADE$, as shown. Given AB = 12, BC = 16, AC = 20, and DE = 20.

Find the scale factor k and the segment lengths AD and CE.

(the diagram is not to scale)



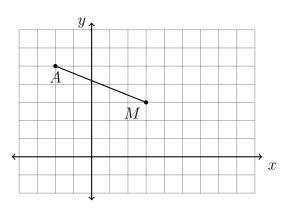
13. As shown, \overline{AB} has endpoints with coordinates A(2,1) and B(8,7). Show the calculation for the coordinates of the midpoint M of \overline{AB} . Mark and label it on the graph.



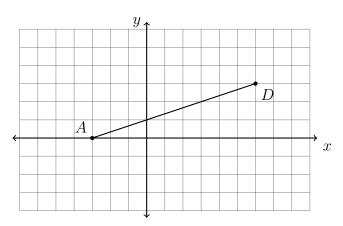
14. A(-2,5) is one endpoint of \overline{AB} . The segment's midpoint is M(3,3). Find the other endpoint, B.

What translation maps

$$A(-2,5) \to M(3,3)$$
?



15. In the diagram below, \overline{AD} has endpoints with coordinates A(-3,0) and D(6,3). What points B and C trisect \overline{AD} into three congruent segments? Mark and label them on the graph. State their coordinates.



16. Given $\triangle ABC$, find the lengths of its sides. A(1,2), B(9,8), C(9,2).

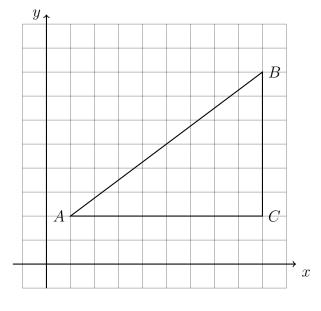


12 December 2019

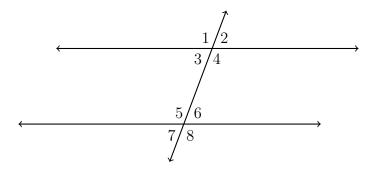


(c) Use the formula for distance:
$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$AB =$$

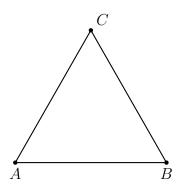


17. Given two parallel lines and a transversal, as shown below. Given $m\angle 1=117$.

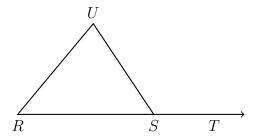


- (a) Find the measure $m \angle 2$.
- (b) Find the measure $m \angle 4$.
- (c) Find the measure $m \angle 5$.
- (d) Given $m \angle 8 = (5x 8)^{\circ}$. Find x.

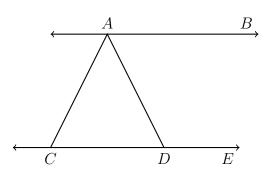
18. Given isosceles $\triangle ABC$ with $\overline{AB} \cong \overline{BC}$, $m \angle A = x$, $m \angle B = 63$, and $m \angle C = y$. Mark and label the diagram, and then find x and y. (the diagram is not to scale)



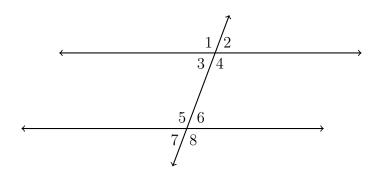
19. Given isosceles $\triangle RSU$ with $\overline{RS} \cong \overline{US}$. If $m \angle UST = 140$ find $m \angle R$. (mark and label the diagram) (the diagram is not to scale)



20. Given parallel lines $\overrightarrow{AB} \parallel \overrightarrow{CDE}$ with $\overline{AC} \cong \overline{CD}$. If $m \angle BAD = 55$ find $m \angle ACD$. (completely mark and label the diagram)

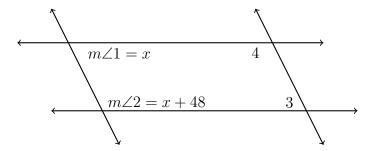


21. Given two parallel lines and a transversal, as shown below.

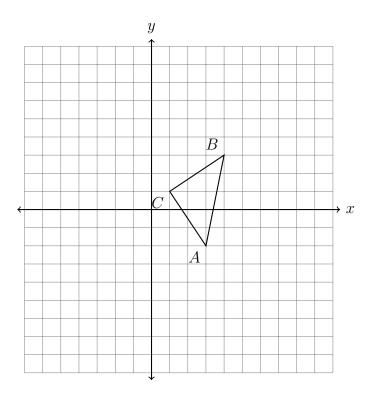


- (a) State the angle corresponding with $\angle 7$.
- (b) What theorem would justify $m \angle 4 + m \angle 6 = 180^{\circ}$?
- (c) What theorem would justify $\angle 3 \cong \angle 6$?
- (d) Given $m\angle 1 = 117^{\circ}$ and $m\angle 8 = (4x 3)^{\circ}$. Find x.

22. Two parallel lines intersect a second set of parallel lines. Given $m \angle 1 = x$ and $m \angle 2 = x + 48$, find the measure of $\angle 4$.



23. Translate $\triangle ABC$ by $(x,y) \rightarrow (x+4,y+2)$ then reflect it over the x-axis. Make a table of the coordinates showing $\triangle ABC \rightarrow \triangle A'B'C' \rightarrow \triangle A''B''C''$ and plot and label the image on the axes.



24. Given $\triangle ABP \sim \triangle JKP$ as shown below. $AB=9.6,\ AP=12.0,\ BP=6.3,\ {\rm and}\ JK=16.0.$ Find JP.

