

9 December 2019

**6.9 Do Now: Analytic proof**

1. The line  $l$  has the equation  $y = \frac{3}{2}x + 5$ .

(a) What is the slope of the line  $k$ , given  $k \parallel l$ ?

(b) What is the slope of the line  $j$ , given  $j \perp l$ ?

2. Find the decimal value of each expression, rounded to the nearest thousandth.

Write your answer as given in example #1.

(a)  $\tan 60^\circ = 1.7320508 \dots$

(c)  $\frac{2}{3}\sqrt{11}$

$\approx 1.732$

(b)  $\tan 30^\circ$

(d)  $\frac{(-5)^2}{7}$

3. Given  $\triangle ABC$ , find the lengths of its sides.  $A(-1, 3)$ ,  $B(5, 7)$ ,  $C(5, 3)$ .

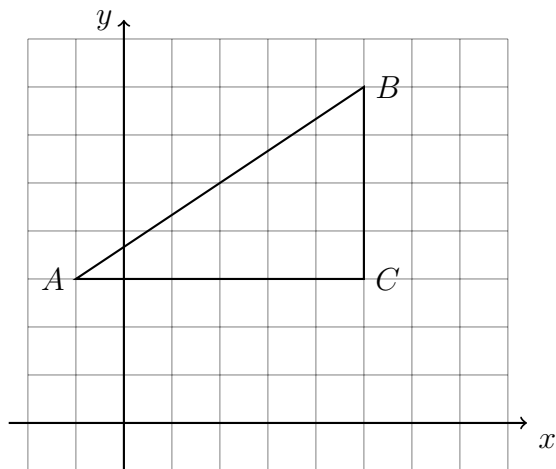
(a)  $AC =$

(b)  $BC =$

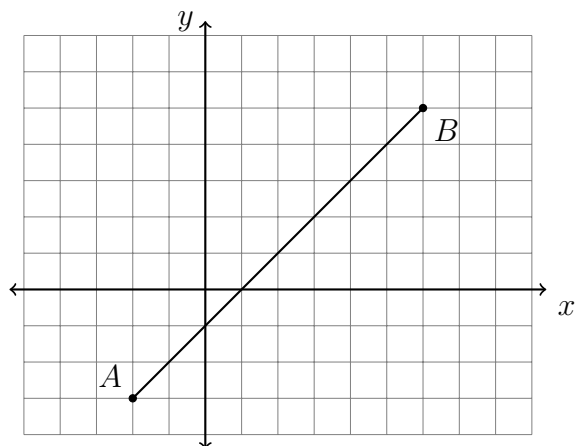
(c) Use the formula for distance:

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$AB =$



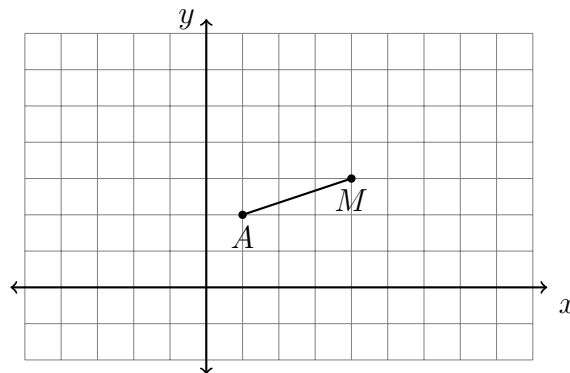
4. As shown,  $\overline{AB}$  has endpoints with coordinates  $A(-2, -3)$  and  $B(6, 5)$ . Show the calculation for the coordinates of the midpoint  $M$  of  $\overline{AB}$ . Mark and label it on the graph.



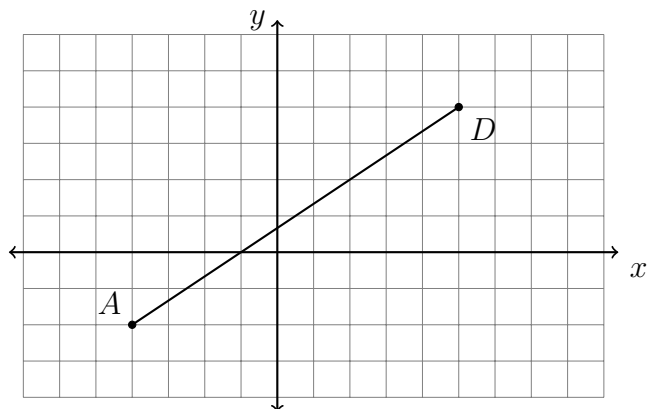
5.  $A(1, 2)$  is one endpoint of  $\overline{AB}$ . The segment's midpoint is  $M(4, 3)$ . Find the other endpoint,  $B$ .

What translation maps

$$A(1, 2) \rightarrow M(4, 3)?$$



6. In the diagram below,  $\overline{AD}$  has endpoints with coordinates  $A(-4, -2)$  and  $D(5, 4)$ . What points  $B$  and  $C$  trisect  $\overline{AD}$  into three congruent segments? Mark and label them on the graph. State their coordinates.



**Spicy Regents problems: Using slope to prove a parallelogram**

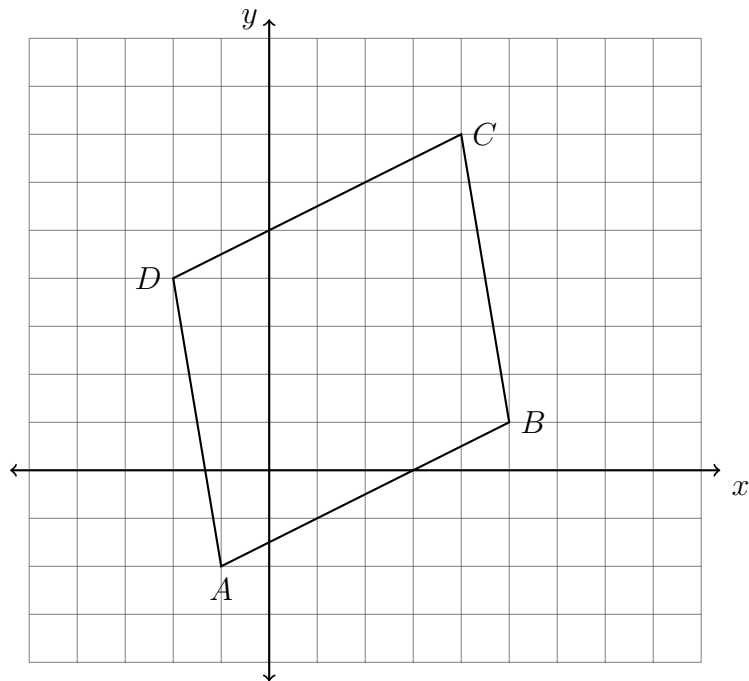
7. In this problem use the following theorem (copy it at the bottom of the page after your calculations):

*A quadrilateral is a parallelogram if and only if it's opposite sides are parallel.*

Shown below is quadrilateral  $ABCD$ ,  $A(-1, -2)$ ,  $B(5, 1)$ ,  $C(4, 7)$ , and  $D(-2, 4)$ .

Prove it is a parallelogram by

- (a) finding the slope of each of the four sides,
- (b) stating which sides are parallel,
- (c) copying the theorem as your conclusion.



**Using the distance formula to prove a parallelogram**

8. In this problem use the following theorem (copy it at the bottom of the page after your calculations):

*A quadrilateral is a parallelogram if and only if it's opposite sides are congruent.*

Shown below is quadrilateral  $ABCD$ ,  $A(-1, -2)$ ,  $B(5, 1)$ ,  $C(4, 7)$ , and  $D(-2, 4)$ .

Prove it is a parallelogram by

- (a) finding the length of each of the four sides,
- (b) stating which sides are congruent,
- (c) copying the theorem as your conclusion.

