

In-class-section. Show work.

- 1) Quadrilateral BCEP has vertices B(-3,1), C(-3,-4), E(1,-1), and P(1,4).  
Find the slopes of the diagonals. Show work using slope formula.

Find the midpoints of the diagonals.

From the above information, what type of quadrilateral is BCEP? Explain how you know.

Length  $\overline{BE} = \sqrt{20}$ , length  $\overline{CP} = \sqrt{80}$ .  
Is BCEP a square? Why or why not?

ANSWERS

$$\text{slope BE} = \frac{1-1}{-3-1} = \frac{2}{-4} = -\frac{1}{2}$$

$$\text{slope CP} = \frac{4-4}{1-3} = \frac{8}{4} = 2$$

They are perpendicular slopes (negative reciprocals).

$$\text{Midpoint BE} = \left( \frac{-3+1}{2}, \frac{1+1}{2} \right) = \left( -\frac{2}{2}, \frac{2}{2} \right)$$

$$\text{Midpoint CP} = \left( \frac{-3+1}{2}, \frac{-4+4}{2} \right) = \left( -\frac{2}{2}, \frac{0}{2} \right)$$

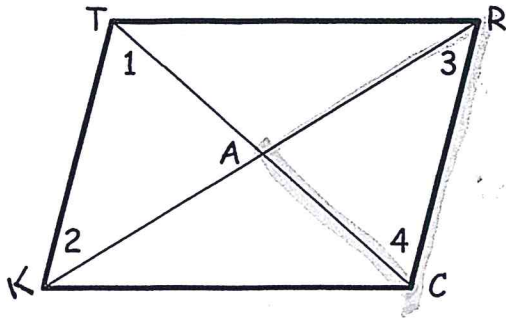
(-1, 0) Share a midpoint (-1, 0)

The diagonals are perpendicular and they bisect each other.  
It must be a rhombus. Length of  $\overline{BE} = \sqrt{20}$ , of  $\overline{CP} = \sqrt{80}$ .  
So the rhombus (is) or is not a square.  
(Diagonals not  $\cong$ )

1a

PROOF. Fill in the blanks. (7 pts)

Prove: The diagonals of a parallelogram bisect each other.



Given: parallelogram TRCK with  $\overline{TR} \parallel \overline{CK}$  and  $\overline{RC} \parallel \overline{TK}$  and diagonals  $\overline{TC}$  and  $\overline{RK}$  intersecting at A.

Show:  $\overline{TC}$  and  $\overline{RK}$  bisect each other.

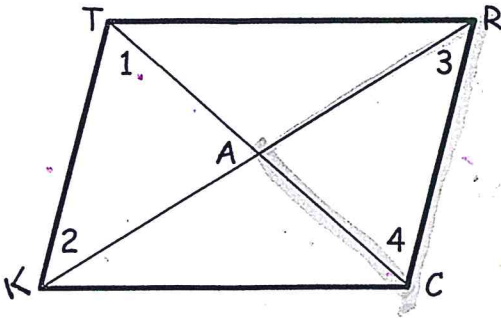
What I know	Why I know
$\overline{TR} \parallel \overline{CK}$ and $\overline{RC} \parallel \overline{TK}$	
	Parallelogram Sides Theorem
$\angle 1 \cong \angle 4, \angle 2 \cong \angle 3$	
$\triangle TAK \cong \triangle CAR$	
$\overline{TA} \cong \overline{CA}, \overline{KA} \cong \overline{RA}$	
	Definition of midpoint
TC and RK bisect each other.	Definition of...

Therefore, the diagonals of a parallelogram bisect each other.

16.  
(ANSWERS)

PROOF. Fill in the blanks. (7 pts)

Prove: The diagonals of a parallelogram bisect each other.



Given: parallelogram TRCK with  $\overline{TR} \parallel \overline{CK}$  and  $\overline{RC} \parallel \overline{TK}$  and diagonals  $\overline{TC}$  and  $\overline{RK}$  intersecting at A.

Show:  $\overline{TC}$  and  $\overline{RK}$  bisect each other.

What I know	Why I know
$\overline{TR} \parallel \overline{CK}$ and $\overline{RC} \parallel \overline{TK}$	Given
$\overline{TK} \cong \overline{CR}$	Parallelogram Sides Theorem
$\angle 1 \cong \angle 4, \angle 2 \cong \angle 3$	Alt Ang Th.
$\triangle TAK \cong \triangle CAR$	ASA Post
$\overline{TA} \cong \overline{CA}, \overline{KA} \cong \overline{RA}$	Def of congruent polygons. (CPCSC)
A is the midpoint of $\overline{TC}$ & $\overline{KR}$	Definition of midpoint
$\overline{TC}$ and $\overline{RK}$ bisect each other.	Definition of... bisect

Therefore, the diagonals of a parallelogram bisect each other.