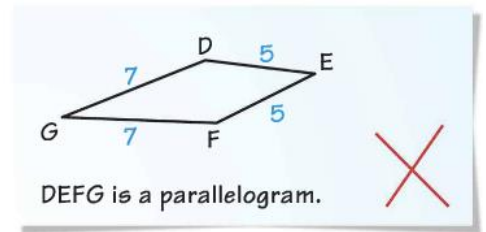


LEVEL: EMERGING

**ERROR ANALYSIS**

- 1) A student claims that because two pairs of sides are congruent, quadrilateral  $DEFG$  shown at the right is a parallelogram. Describe the error that the student is making.

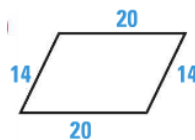


**REASONING** Directions: What property can you use to show that the quadrilateral is a parallelogram?

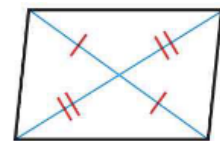
2)



3)



4)



- 5) **SHORT RESPONSE** When you shift gears on a bicycle, a mechanism called a *derailleur* moves the chain to a new gear. For the derailleur,  $JK = 5.5\text{ cm}$ ,  $KL = 2\text{ cm}$ ,  $ML = 5.5\text{ cm}$ , and  $MJ = 2\text{ cm}$ . Explain why  $\overline{JK}$  and  $\overline{ML}$  are always parallel as the derailleur moves.

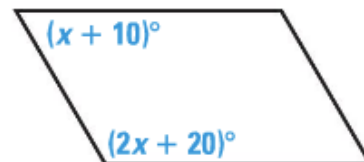


**ALGEBRA** Directions: For what value of  $x$  is the quadrilateral a parallelogram?

6)



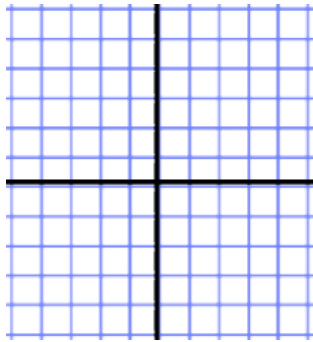
7)



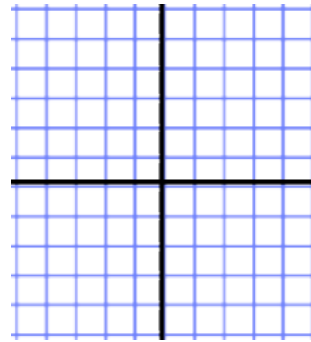
## LEVEL: PROFICIENT/MASTERY

**COORDINATE GEOMETRY** Directions: The vertices of quadrilateral ABCD are given. Draw ABCD in a coordinate plane and show that it is a parallelogram. (Concrete algebraic evidence must be shown.)

8)  $A(-4, 2), B(-1, 5), C(5, 0), D(2, -3)$

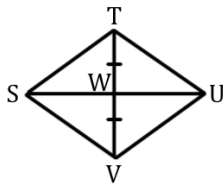


9)  $A(-3, 2), B(1, 5), C(2, 0), D(-2, -3)$

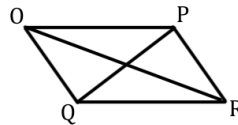


Directions: Find the value of  $x$  that would make the quadrilateral a parallelogram. Then find the indicated measure.

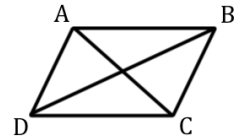
10)  $m\angle SU = 12x$ ;  $m\angle UW = 3x + 2$   
Find the  $m\angle SU$ .



11)  $m\angle POR = 4x + 12$ ;  $m\angle QOR = 52^\circ$ ;  $m\angle OQR = 12x - 2$   
Find the  $m\angle ORQ$ .

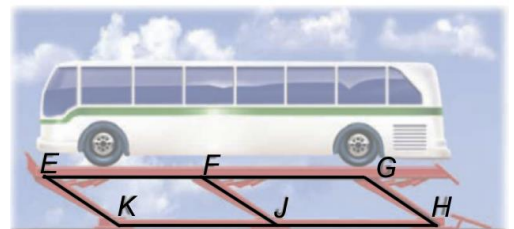


12)  $m\angle BDC = 7x + 2$ ;  $m\angle ADB = 12x - 6$ ;  $m\angle ABD = 3x + 18$   
Find the  $m\angle DAB$ .



- 13) The diagram shows an automobile lift. A bus drives on to the ramp ( $\overline{EG}$ ). Levers ( $\overline{EK}$ ,  $\overline{FJ}$ , and  $\overline{GH}$ ) raise the bus. In the diagram,  $\overline{EG} \cong \overline{KH}$  and  $\overline{EK} = \overline{FJ}$ . Also, F is the midpoint of  $\overline{EG}$ , and J is the midpoint of  $\overline{KH}$ .

- a) Identify all of the quadrilaterals in the automobile lift. *Explain* how you know each one is a parallelogram.



- b) *Explain* why  $\overline{EG}$  is always parallel to  $\overline{KH}$ .