

## LESSON 173 .....

- Use the Angle Addition Postulate [7.7].  
 $m\angle AOB + m\angle BOC + m\angle COD = 180^\circ$   
 $m\angle AOB + 112^\circ + m\angle AOB = 180^\circ$   
 $2m\angle AOB = 68^\circ$   
 $m\angle AOB = 34^\circ$
- $\angle 1 \cong \angle 2$  as vertical angles.  
 $\angle 3 \cong \angle 4$  as vertical angles.  
 $\angle 1 \cong \angle 3$  as corresponding angles.  
 $\angle 2 \cong \angle 4$  as corresponding angles.  
 $\angle 1 \cong \angle 4$  as alternate exterior angles.  
 $\angle 2 \cong \angle 3$  as alternate interior angles.
- An exterior  $\angle$  is the sum of its two remote interior  $\angle$ s.  
 $3x + 10 = 68 + 74$ ;  $x = 44$
- interior angle sum =  $180(n - 2) = 180(12 - 2) = 1800^\circ$   
 exterior angle sum of any polygon =  $360^\circ$
- The reflection maps  $P(-2, 3)$  to  $P'(-2, -3)$ .  
 The translation maps  $P'(-2, -3)$  to  $P''(1, -3)$ .  
 So, the final image is  $(1, -3)$ .
- a translation of 4 units right; A composition of reflections over two parallel lines is a translation. Use a simple point like  $(0, 0)$  to find the rule.
- Answers may vary. Sample(s):*  
 a dilation about the origin by scale factor  $2/3$ ,  
 a reflection over the  $y$ -axis, and then  
 a translation of 2 units right and 1 unit up
- Each term is 4 more than the previous term. The next term is  $17 + 4 = 21$ .
- Addition Property; Add 3 to both sides.
- Assume that a quadrilateral can have 4 obtuse angles.
3. Definition of bisect (or angle bisector)  
 4. Reflexive Property  
 5. AAS  
 6. CPCTC
- SSS, SAS, HL
- A midsegment is parallel to the third side and half the length of the third side.  
 $x$  and 74 are corresponding angles, so  $x = 74$ .  
 $y$  is twice the length of the midsegment, so  $y = 14$ .
- A) 4, B) 3, C) 1, D) 2
- $P$  is the centroid and divides  $\overline{AD}$  in the ratio 2:1.  
 $PD = AP/2 = 10/2 = 5$   
 $AD = AP + PD = 10 + 5 = 15$

- Angles in a triangle add up to  $180^\circ$ .

$$m\angle Z = 180 - 48 - 82 = 50^\circ$$

The larger angle has the longer opposite side.

$YZ < XY < XZ$  because  $m\angle X < m\angle Z < m\angle Y$ .

- square; A quadrilateral with bisecting diagonals is a parallelogram. A parallelogram with congruent diagonals is a rectangle. A parallelogram with perpendicular diagonals is a rhombus. A quadrilateral that is a rhombus and a rectangle is a square.

- Corresponding sides must be proportional.

$$\frac{12}{18} = \frac{a}{a + 15} \rightarrow 12(a + 15) = 18a \rightarrow a = 30$$

$$\frac{12}{18} = \frac{24}{24 + b} \rightarrow 12(24 + b) = 18(24) \rightarrow b = 12$$

- Use the Altitude Rule [68.1].

$$4^2 = 8x; x = 2$$

Use the Leg Rule [68.2].

$$y^2 = x(x + 8); y = 2\sqrt{5}$$

- $\triangle ADE \sim \triangle ABC$  by AA.

$$\frac{AD}{AB} = \frac{DE}{BC} \rightarrow \frac{24}{36} = \frac{DE}{15} \rightarrow 36DE = 24(15)$$

$$DE = 10$$

He is 10 m high from the ground.

$$21. \sin 30^\circ = \frac{1}{2} \quad \cos 30^\circ = \frac{\sqrt{3}}{2} \quad \tan 30^\circ = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$$

- Find  $XY$ :  $XY^2 = YZ^2 + XZ^2$

$$XZ = \sqrt{12^2 - 4^2} = \sqrt{128} \approx 11.3$$

$$\text{Find } m\angle Y: \cos Y = 4/12$$

$$m\angle Y = \cos^{-1}(4/12) \approx 70.5^\circ$$

$$\text{Find } m\angle X: m\angle X \approx 180 - 90 - 70.5 = 19.5^\circ$$

- $\sin \theta = 30/80$

$$\theta = \sin^{-1}(30/80) \approx 22^\circ$$

The angle of depression is about  $22^\circ$ .

