Practice with Lines, Angles, Triangles, & Parallelograms

● Find the value of each variable. Then find the measure of each labeled angle.

1.

(x+15°)
(2x−30°)

$x+15 = 2x-30$
$-x = -45$
$x = 45$

60°

2.

(3x−44°)
(x−24°)

142°
38°

$3x-44 + x-24 = 180$
$4x-68 = 180$
$4x = 248$
$x = 62$

3.

(3x+34)°
(3y−35)°
5x°   2y°

85°   70°

$3y-35 = 2y$
$y = 35$
$5x = 3x+34$
$2x = 34$
$x = 17$

Name two triangles that are congruent by ASA.

4.

△KLM ≅ △JIH

5.

△RST ≅ △YXZ
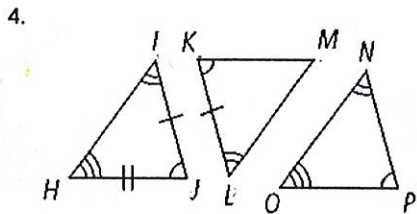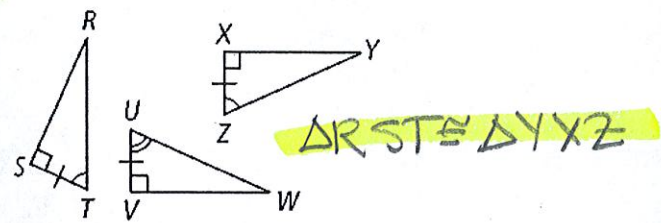
Would you use SSS or SAS to prove these triangles congruent? If there is not enough information to prove the triangles congruent by SSS or SAS, write *not enough information*. Explain your answer.
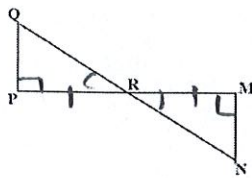
6.

SSS

7.

SAS
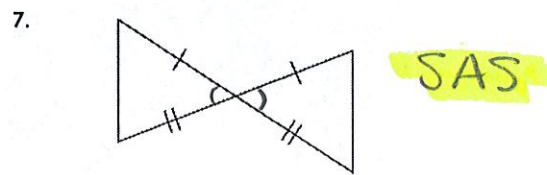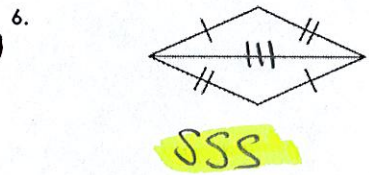
8. **Given:** $\overline{BD}$ is the perpendicular bisector of $\overline{AC}$
   Prove: △BAD ≅ △BCD

· defn of ⊥
· defn of bisect
· all rt ∠s ≅
· reflexive
· SAS
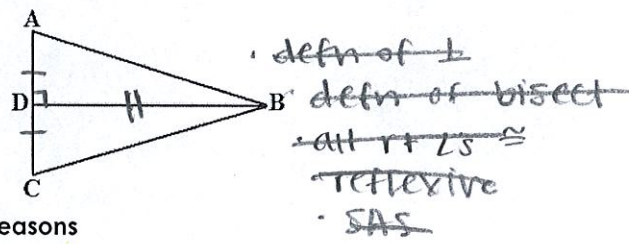
Statements	Reasons
1) $\overline{BD}$ is the perpendicular bisector of $\overline{AC}$.	1) Given
2) $\overline{AD} \cong \overline{CD}$	2) Definition of segment bisector
3) ∠ADB and ∠CDB are right ∠s.	3) Definition of perpendicular
4) ∠ADB ≅ ∠CDB	4) all rt ∠'s ≅
5) $\overline{DB} \cong \overline{DB}$	5) Reflexive prop.
6) △BAD ≅ △BCD	6) SAS

9 Given: ∠P and ∠M are right angles.
R is the midpoint of $\overline{PM}$.
Prove: △PQR ≅ △MNR

· all rt ∠s ≅
· defn of midpt.
· vert ∠s ≅
· ASA

statements | reasons

1) ∠P & ∠M are rt ∠s
   R is midpt of $\overline{PM}$ | 1) Given

2) ∠P ≅ ∠M | 2) all rt ∠s ≅

3) $\overline{PR} ≅ \overline{MR}$ | 3) defn of midpt.

4) ∠PRQ ≅ ∠MRN | 4) vert ∠s ≅

5) △PQR ≅ △MNR | 5) ASA

Find the values of the variables in each parallelogram (14 is a trapezoid)..
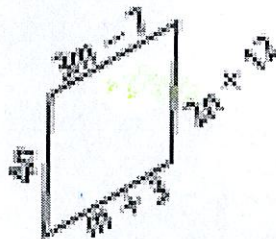
10.
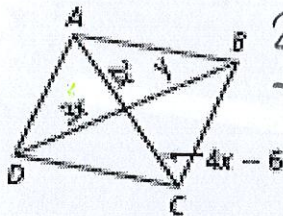
$2x = 4x - 6$
$-2x = -6$
$x = 3$
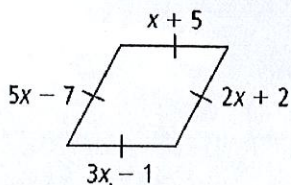$3(3) = y$
$y = 9$

11.

$3m - 7 = m + 3$
$2m = 10$
$m = 5$
$4n = 2n + 12$
$2n = 12$
$n = 6$

12.

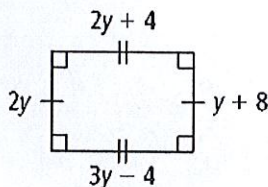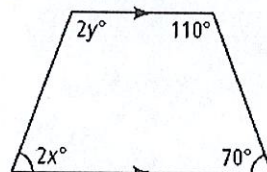$x + 5 = 3x - 1$
$-2x = -6$
$x = 3$

13.

$2y + 4 = 3y - 4$
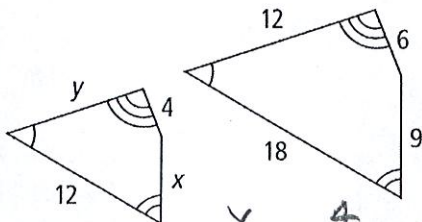$-y = -8$
$y = 8$

14.

$2x = 70$
$x = 35$
$2y = 110$
$y = 55$

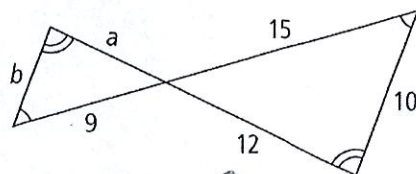**The polygons are similar. Find the value of each variable.**

15.

$\dfrac{x}{9} = \dfrac{4}{6}$ $6x = 36$
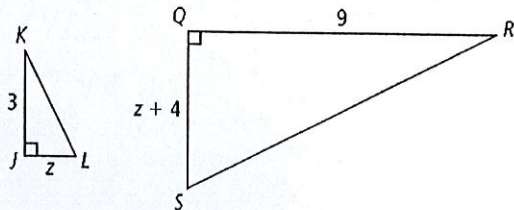$x = 6$

16.

$\dfrac{a}{12} = \dfrac{9}{15}$ $\dfrac{b}{10} = \dfrac{9}{15}$
$15a = 108$ $15b = 90$
$a = 7.2$ $b = 6$

17.

$\dfrac{3}{9} = \dfrac{z}{z+4}$

$3z + 12 = 9z$
$12 = 6z$
$z = 2$