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Using Deductive Reasoning

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Unit 1

1.7 Using Deductive Reasoning

Objective 1.7

- Students will use deductive reasoning to solve problems and verify conjectures.

Essential Question

How are certain pairs of angles related?

DO NOW

Copies

1.6 Mixed Exercises

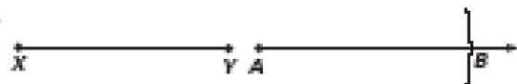
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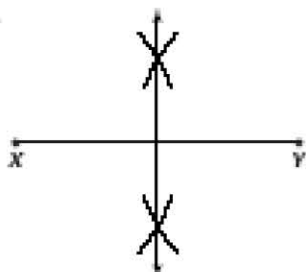
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Practice 1-6: Mixed Exercises

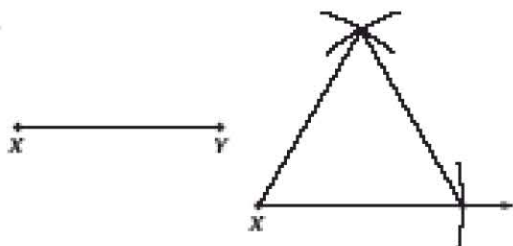
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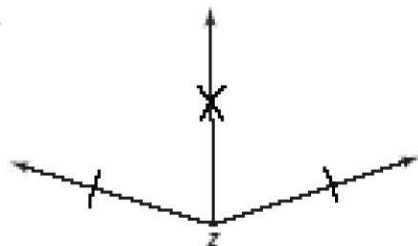
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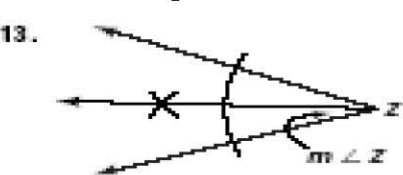
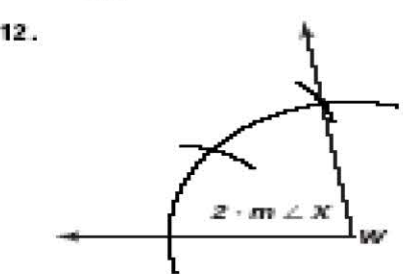
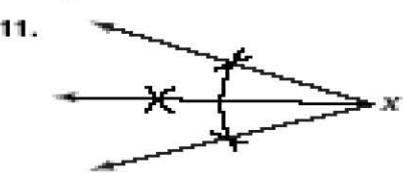
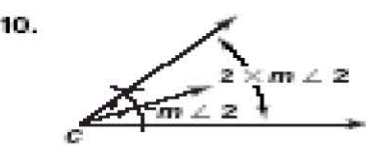
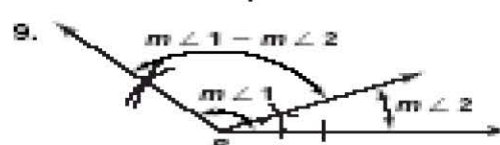
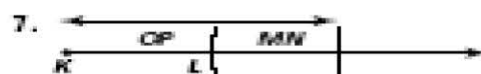
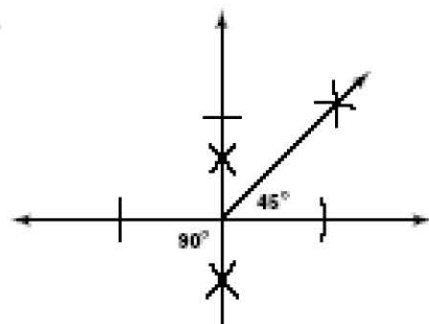
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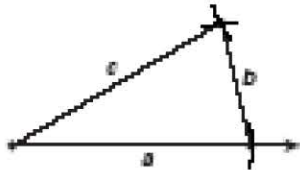


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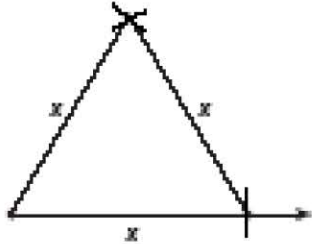


Practice 1-6: Example Exercises

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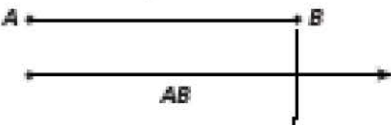
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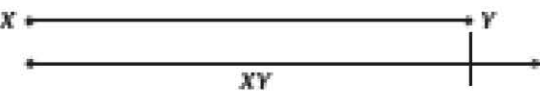
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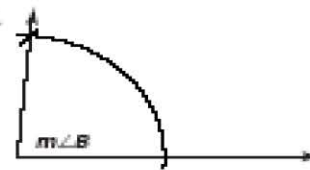
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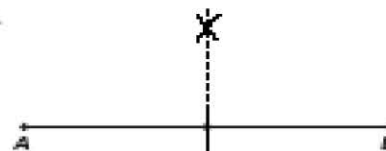
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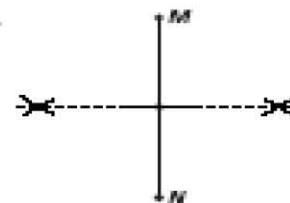
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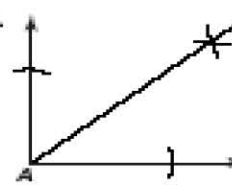
10.



11.



12.



Vocabulary

- **Deductive Reasoning:** is a process of reasoning logically from given facts to a conclusion.
-

Properties of Equality and Real Numbers

Addition Property

If $a = b$, then $a + c = b + c$

Subtraction Property

If $a = b$, then $a - c = b - c$

Multiplication Property

If $a = b$, then $a \cdot c = b \cdot c$

Division Property

If $a = b$, then $\frac{a}{c} = \frac{b}{c}$ ($c \neq 0$)

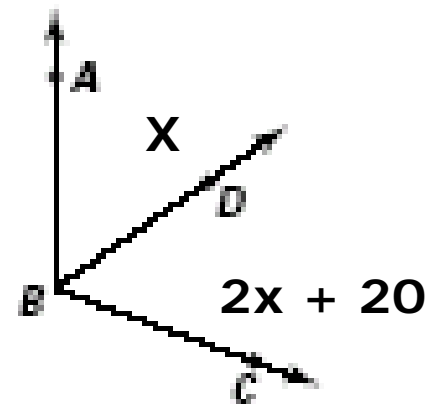
Substitution Property

If $a = b$, then b can replace a in any expression

Distributive Property

$a(b+c) = ab + ac$

Example 1



$m\angle ABC = 140$, Solve for x and justify each step

$$\angle ABD + \angle DBC = \angle ABC \quad \text{Angle addition Postulate}$$

$$x + (2x + 20) = 140 \quad \text{Substitution}$$

$$3x = 120 \quad \text{Subtraction Property of Equality}$$

$$x = 40 \quad \text{Division Property of Equality}$$

Properties of Congruence

□ Reflexive Property

$$AB \cong AB$$

□ Symmetric Property

If $AB \cong CD$, then $CD \cong AB$

If $\angle A \cong \angle B$, then $\angle B \cong \angle A$

□ Transitive Property

If $AB \cong CD$ and $CD \cong EF$, then $AB \cong EF$

If $\angle A \cong \angle B$ and $\angle B \cong \angle C$, then $\angle A \cong \angle C$

Example 1 (b)

Name the property of equality or congruence illustrated

a. $\angle k = \angle k$

b. If $2x - 8 = 10$, then $2x = 18$

c. If $RS = TW$ and $TW = PQ$ then
 $RS = PQ$

d. If $\angle A = \angle B$ then $\angle B = \angle A$

Angles Pairs

- There are pairs of angles with special names. The most important are
 - a. Vertical angles
 - b. Adjacent angles
 - c. Complementary angles
 - d. Supplementary angles
-

Theorems

1.1 Vertical Angles Theorem

Vertical angles are congruent

1.2. Congruent Supplements Theorem

If two angles are supplements of congruent angles (or of the same angle), then the two angles are congruent.

1.3 Congruent Complements Theorem

If two angles are complements of congruent angles (or the same angle), then the two angles are congruent.

*Problems pages 50 and 51 TE

□ TOD

Work book

Practice 1.7 Example Exercises (odds)

□ Homework

Practice 1.7 Example Exercises (even)

1.7 Practice

Practice 1-7: Example Exercises

1. 15 2. 18 3. 15 4. 45 5. 11 6. $x = 6, y = 150$

7. $x = 8, y = 40$ 8. $\angle 1$ and $\angle 3, \angle 2$ and $\angle 4$ 9. any two of the following pairs: $\angle 1 + \angle 2; \angle 2 + \angle 3; \angle 3 + \angle 4; \angle 4 + \angle 1$. 10. angles 1 and 3, angles 2 and 4 11. 180

12. supplementary 13. 180 14. supplementary

15. Let $m\angle 1 = m\angle 3 = x$. Then $m\angle 2 = 180 - x$ and $m\angle 4 = 180 - x$. So $m\angle 2 = m\angle 4$.

1.7 Practice

Practice 1-7: Mixed Exercises

1. 30 2. 15 3. 30 4. 6 5. 16 6. 9 7. false 8. true
9. true 10. true 11. false 12. false 13. false 14. true
15. true 16. false 17. false 18. $m\angle PMO = 55$;
 $m\angle PMQ = 125$; $m\angle QMN = 55$ 19. $m\angle BOD =$
 $m\angle COE = 90$; $m\angle BOC = m\angle COD = 45$;
 $m\angle AOB = m\angle DOE = 45$ 20. $m\angle BWC =$
 $m\angle CWD$; $m\angle ANB + m\angle BWC = 180$; $m\angle CWD +$
 $m\angle DNA = 180$; $m\angle ANB = m\angle AND$