# Chapter Test

Chapter 2

Form B

For each statement, (a) write the converse, and (b) decide whether the converse is true or false.

1. If a polygon is a pentagon, then it has five sides.
   (a) If a polygon has 5 sides, then it is a pentagon   (b) true
2. If Mary lives in Minneapolis, then she lives in Minnesota.
   (a) If Mary lives in Minnesota, then she lives in Minneapolis.   (b) false
3. If two angles are supplements, then their sum equals 180.
   (a) If the sum of 2 ∠'s equals 180, then they are supplements. (b) true

For Exercises 4–8, name the property that justifies each statement.

4. $AB = AB$
   Reflexive POE

5. If $m\angle A = 42$ and $m\angle A = m\angle G$, then $m\angle G = 42$.
   Substitution POE (or Transitive POE)

6. If $m\angle B = m\angle C$, then $m\angle B + m\angle X = m\angle C + m\angle X$.
   Addition POE

7. If $2(BC) = 13$, then $BC = 6.5$.
   Division POE

8. If $2(3x - 7) = x + 5$, then $6x - 14 = x + 5$.
   Distributive Prop.

9. Use the diagram at the right to find the measure of each angle.
   a. $\angle AOG$ 90 (vert ∠)   b. $\angle AOB$ 38 (90−52)
   c. $\angle COE$ 128 (90+38)   d. $\angle AOE$ 142 (90+52)
   e. $\angle FOG$ 26 (52÷2)   f. $\angle FOB$ 154 (90+26+38)

(diagram with points A, B, C, G, E, F, D, O; angles 38°, 52°, 26, 26; 90−52=38; 52)
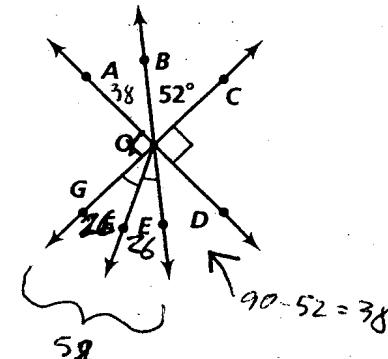
For Exercises 10–13, find the value of the variable in each diagram.

10. (50)

(diagram: $(3x − 63)°$ and $(x + 37)°$)

$3x - 63 = x + 37$
$2x = 100$
$x = 50$

11. (13.5)

(diagram: $99−2x$, $(8x)°$, $(99 − 2x)°$)

$(99 - 2x) + 8x = 180$
$6x + 99 = 180$
$6x = 81$
$x = 13.5$

12. (4)

(diagram: $(12x + 14)°$, $3x+2$, $(3x + 2)°$)

$(12x+14) + 90 + 2(3x+2) = 180$
$12x + 14 + 90 + 6x + 4 = 180$
$18x + 108 = 180$
$18x = 72$

13. (180)

(diagram: $(\frac{1}{2}x + 52)°$, $38°$)

$(\frac{1}{2}x + 52) + 38 = 180$
$\frac{1}{2}x + 90 = 180$
$\frac{1}{2}x = 90$
$x = 180$
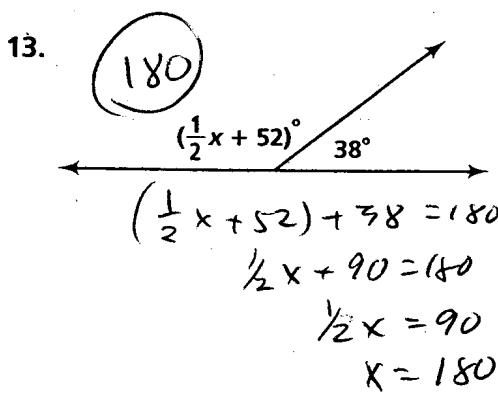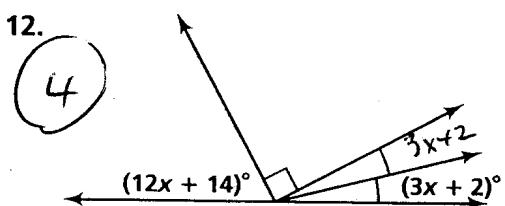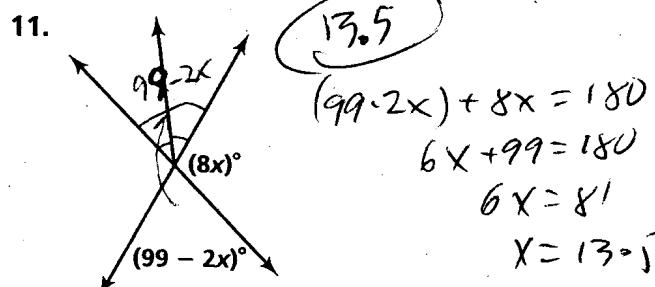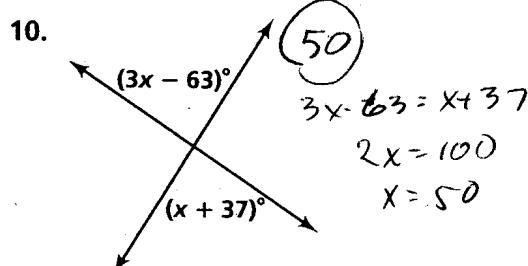
Chapter Test (continued)   Form B

Chapter 2

For Exercises 14–17, use deductive reasoning to draw any possible conclusions. Write *not possible* if you cannot draw any conclusions.

14. If an angle measures 42 degrees, then it is acute. ∠A is an acute angle. *NP – situation relates to concl.*

15. All good tennis players are quick. Martina is a good tennis player. *Martina is quick (Law of Detachment)*

16. If I don't wear sunscreen while swimming, then I'll get sunburned. If I get sunburned, then I'll be in pain. *Law of Syllogism* *If I don't wear sunscreen while swimming, then I'll be in pain.*

17. If two angles are vertical angles, then they are congruent. ∠A and ∠B are vertical angles. *∠A and ∠B are congruent. (Law of Detachment)*

18. Rewrite the following biconditional as two conditionals:

    A quadrilateral is a parallelogram if and only if it has two pairs of opposite sides that are parallel.

    ① If a quadrilateral is a parallelogram then it has 2 pairs opp. sides ∥.
    ② If a quad. has 2 pairs opp. sides ∥ then it is a parallelogram.

For Exercises 19–22, determine whether each statement is a good definition. If it is not, provide a counterexample.

19. A square has four right angles. *No – Rectangle*

20. Vertical angles have the same measure. *No – 2 congruent and adjacent ∠'s may have same measure but not be vertical.*

21. Complementary angles are two angles whose measures add up to 90. *Good defn.*

22. Spiders have eight legs. *No – other creatures have 8 legs. example – octopus.*

23. Give a reason for each step.

    5(7x + 23) = 45   Given
    7x + 23 = 9   **a.** ? *Div POE*
    7x = −14   **b.** ? *Subtraction POE*
    x = −2   **c.** ? *Div POE*

24. If m∠A = 83, then what is the measure of the complement of ∠A? *(7) 90−83*

25. If the complement of ∠B is 67, then what is the measure of ∠B? *(23) 90−x=67*

26. If m∠C = 131, then what is the measure of the supplement of ∠C? *(49) 180−131*

27. If the complement of ∠D is 27, then what is the measure of the supplement of ∠D? *(117) 90−x=27 x=63 180−63=117*

Find the measure of each angle described.

28. Four times the measure of the angle is twice that of its complement. *(30) 4x = 2(90−x)*

29. Half the measure of the angle is 25 more than one-third the measure of its supplement. *(102) ½x = 25 + ⅓(180−x) 3x = 150 + 2(180−x)*

30. The measure of the angle is half the difference between its complement and supplement. *(45) x = ½((180−x)−(90−x)) = ½(180−x−90+x) = ½(90) = 45*