1. B, D, F

   A is false because the rays have different endpoints. C is false because two points determine a line. E is false because the supplement of an acute angle is obtuse.

2. B, C

3. A; The first step is to add 4 to both sides.

4. Use the Segment Addition Postulate [7.6].
   $AP + PB = AB$
   $2x + (3x - 2) = 18; x = 4$
   $AP = 2(4) = 8$
   $PB = 3(4) - 2 = 10$

5. Angles in a triangle add up to 180°.
   $x + 2x + 3x = 180$
   $x = 30$

   The triangle has angles measuring 30°, 60°, and 90°, so it is a right triangle.

6. Angles in a triangle add up to 180°.
   $m\angle BCA = 180 - 90 - 58 = 32°$

   If lines are parallel, then alternate interior angles are congruent.

   $m\angle 1 = m\angle BCA = 32°$

7. B

8. 3. All right angles are congruent.
   4. If corresponding angles are congruent, then lines are parallel.

9. A; A maps the point to (1, −1). B, C, and D map the point to (−1, −1).

10. Assume that n is odd.

11. interior angle sum of a hexagon = 180(6 − 2) = 720°

12. A; 2 + 4 > 8 is false. The sum of two sides of a triangle must be greater than the third side.

13. D; The included angles must be congruent.

14. Use the Leg Rule [68.2].
    $12^2 = 6(6 + x)$
    $x = 18$

15. C; tan 60° = $\sqrt{3}$

16. Corresponding sides must be proportional.

    $\dfrac{16}{16 + 8} = \dfrac{x}{x + 7}$ → $16(x + 7) = 24x$ → $x = 14$

    $\dfrac{16}{16 + 8} = \dfrac{10}{y}$ → $16y = 24(10)$ → $y = 15$

17. A diagonal divides a rhombus into two congruent isosceles triangles with congruent base angles.
    $m\angle 1 = 62°$

    Angles in a triangle add up to 180°.
    $m\angle 2 = 180 - 62 - 62 = 56°$

18. In a parallelogram, opposite angles are congruent, and consecutive angles are supplementary.
    Let $4x$ and $5x$ be the two angles.
    $4x + 5x = 180; x = 20$
    The angles are 80°, 100°, 80°, and 100°.

19. D; The quadrilateral is a parallelogram because opposite sides are congruent. A rhombus is a parallelogram with perpendicular diagonals.

20. A centroid divides a median in the ratio 2:1.
    $AP = 2PD$
    $3x - 4 = 2x; x = 4$
    $AD = AP + PD = 8 + 4 = 12$

21. B, C, D, E

22. B

23. 3. If lines are parallel, then alternate interior angles are congruent.
    4. Reflexive Property
    5. ASA

24. A midsegment is half the length of the third side.
    perimeter of $\triangle STU = ST + TU + SU$
    $= XZ/2 + XY/2 + YZ/2$
    $= 15 + 13 + 12 = 40$

25. The midsegment is half the sum of the bases.
    $MN = (PQ + SR)/2$
    $7 = (5 + SR)/2$
    $SR = 9$

26. Angles in a triangle add up to 180°.
    $m\angle Z = 180 - 55 - 65 = 60°$

    The larger angle has the longer opposite side.
    $YZ < XY < XZ$ because $m\angle X < m\angle Z < m\angle Y$.

27. C

28. The triangle is obtuse because $11^2 > 7^2 + 8^2$.

29. sin 50° = $x/20$
    $x = 20$ sin 50° ≈ 15.3
    The top of the ladder reaches about 15.3 ft high.

30. $\dfrac{5}{h} = \dfrac{8}{24}$ → $8h = 5(24)$ → $x = 15$

    The tree is 15 ft tall.
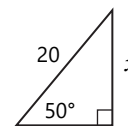
LESSON 132 ··

1. slope $m = (6 - 4)/(3 - 2) = 2$
   point-slope form: $y - 4 = 2(x - 2)$
   slope-intercept form: $y = 2x$

2. Add the two equations to get $3x = 6$ and $x = 2$.
   Use the first equation to get $2 - y = 3$ and $y = -1$.
   So, the lines intersect at $(2, -1)$.

3. By factoring: By completing the square:
   $x^2 + 2x - 3 = 0$ $x^2 + 2x + 1 = 3 + 1$
   $(x - 1)(x + 3) = 0$ $(x + 1)^2 = 4$
   $x = 1, x = -3$ $x + 1 = 2, x + 1 = -2$
                              $x = 1, x = -3$

4.

   A   B   C

5. Use the Angle Addition Postulate [7.7].
   $m\angle XOY + m\angle YOZ = m\angle XOZ$
   $2m\angle YOZ + m\angle YOZ = 150°$
   $m\angle YOZ = 50°$

6. complementary angles   7. alternate interior angles
   $2x + x = 90$ $5x + 6 = 116$
   $x = 30$ $x = 22$

8. $\triangle$ angle sum = 180   9. quad. angle sum = 360
   $x + 100 + 46 = 180$ $5x + 4x + 5x + 4x = 360$
   $x = 34$ $x = 20$

10. interior angle sum = $180(n - 2) = 180(5 - 2) = 540°$
    one interior angle = 540/5 = 108°

    exterior angle sum of any polygon = 360°
    one exterior angle = 360/5 = 72°

11. interior angle sum = one interior angle × n
    $180(n - 2) = 135n$; $n = 8$
    The polygon has 8 sides.

12. $(-3, -4)$ 13. $(-4, 2)$

14. a rotation of 180° about the origin; A composition of
    reflections over two intersecting lines is a rotation.

15. 11111

16. *Answers may vary. Sample(s):*
    two equilateral triangles with different side lengths

17. If two segments are congruent, then they have the
    same length.
    If two segments have the same length, then they are
    congruent.

18. If a figure is a rhombus, then it is a quadrilateral.

19. Substitution Property

20. Transitive Property

21. Addition Property; Add 7 to both sides.

22. Assume that $\angle 1$ and $\angle 2$ are both right angles.

23. $\triangle PEF \cong \triangle PGH$ by SAS.

24. There is not enough information.

25. 2. Alternate interior $\angle$s on parallel lines are $\cong$.
    3. ASA
    4. CPCTC

26. $\triangle DEF$ is equilateral and thus equiangular, so $a = 60$.
    $\triangle DFG$ is isosceles with $m\angle DFG = 120°$, so $b = 30$.

27. $\triangle RSV$ is isosceles, so $a = m\angle V = 40$.
    $\triangle RTU$ is isosceles with vertex angle 46°, so $b = 67$.
    c is an exterior angle of $\triangle RTU$, so $c = 46 + b = 113$.