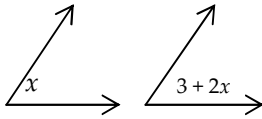


WS 15 – Complementary and Supplementary Angles

1.

Step 1



Step 2: $x + 3 + 2x = 90 \Rightarrow x = 29$

Step 3: $m\angle 1 = 29; m\angle 2 = 61$

2. $x + 6 + 2x = 90 \Rightarrow x = 28; \text{Larger } \angle = 62$

3. 22.5°

4. 75°

p. 64 #2, 4, 8, 10

2. a) $\angle MJK$ b) $\angle NOR$ $\angle POR$ c) None
4. a) $m\angle 2 = 30$ b) ≈ 1.2
8. $\angle ROP$
10. a) $(-3, 2)$ b) 117



p. 69 #1-3, 5, 10, 11, 16, 18, 19, 21

1. $\angle A$ & $\angle C$

2. 110°

3. $(90 - y)^\circ$

5. 30 and 60

10. 60

11. 125

16. 110 and 70

18. 158

19. 27

21. 30



p. 102 #3, 7, 12, 13

3. 43

7. No

12. 36, 90, 54

13. They are right angles.



p. 64 #12, 14

12. 5°

14. $m\angle ABO = 22^\circ$



p. 69 #22, 23

22. $163\frac{1}{3}$

23. 12



p. 102 #14, 15

14. **a** and **b**

15. $132\frac{3}{4}$ or 140



p. 74 #1-9

I haven't listed the given statements for #1-9 to save space and time. Given statements would be appropriate for each problem.

1.

Statement	Reason
$\angle ABC$ is a right angle	If 2 lines are perpendicular, then they form a right angle. (Definition of perpendicular)

2.

Statement	Reason
$m\angle DEF + m\angle HEF = 90$	If two angles are complementary, then their sum is 90° . (Definition of complementary)

3.

Statement	Reason
\overline{XZ} bisects $\angle WXY$	If a ray divides an angle into 2 congruent angles, then it bisects the angle. (Definition of an angle bisector)

4.

Statement	Reason
$\angle PQT \cong \angle TQS \cong \angle SQR$	If two rays trisect an angle, then they divide the angle into three equal angles. (Definition of angle trisectors)

5.

Statement	Reason
$\overline{AE} \cong \overline{EC}$	If a point is a midpoint of a segment, then it divides the segment into two equal segments. (Definition of midpoint)



6.

Statement

$$\overline{CA} \cong \overline{AR} \cong \overline{RD}$$

Reason

If 2 points trisect a segment, then they divide the segment into three equal segments. (Definition of segment trisector)

7.

Statement

$\angle PQR$ and $\angle SQR$ are a linear pair.

Reason

If the sum of two adjacent angles is a straight line, then they are a linear pair. (Definition of a linear pair)

8.

Statement

$$\overline{VZ} \cong \overline{ZY}$$

Reason

If a line bisects a segment, then it divides the segment into 2 congruent segments. (Definition of bisect)

Z is the midpoint of \overline{VY}

If a point is a bisection point of a segment, then it is the midpoint. (Definition of midpoint)

9.

Statement

$\angle PAR$ is a right angle

Reason

If 2 segments are perpendicular, then they form a right angle. (Definition of perpendicular)

$$\angle PAR = 90^\circ$$

If an angle is a right angle, then its measure is 90° .
(Definition of a right angle)



p. 74 #10-12

10.

Statement	Reason
$\overline{BF} \cong \overline{FD}$	If a line bisects a segment, then it divides the segment into two congruent segments (definition of bisector)
F is the midpoint of \overline{BD}	If a line bisects a segment, then it bisects it at the midpoint (definition of midpoint)

11.

Statement	Reason
\overline{EN} and \overline{EG} trisect $\angle AEL$	If a pair of segments divides an angle into three congruent angles, then those segments are angle trisectors. (definition of trisect)
\overline{EN} bisects $\angle AEG$	If a segment divides an angle into two congruent angles, then it is an angle bisector. (definition of angle bisector)
\overline{EG} bisects $\angle NEL$	If a segment divides an angle into two congruent angles, then it is an angle bisector. (definition of angle bisector)

12.

Statement	Reason
$\angle PQS$ is a right angle	If the measure of an angle is 90° , then it is a right angle (definition of right angle)
$\overline{RS} \perp \overline{QP}$	If a line and a ray form a right angle, then they are perpendicular (definition of perpendicular)



p. 98 #8, 9, 14

8. 68

9. 70

14. 50



p. 69 #7–9

7.

STATEMENTS	REASONS
1. $\angle GHJ$ is a straight angle	1. Assumed from the diagram
2. $\angle GJH = 180^\circ$	2. If an angle is a straight angle, then it measures 180° (definition of straight \angle)
3. $m\angle GHJ = m\angle GHK + m\angle KHJ$	3. Angle addition postulate
4. $180^\circ = m\angle GHK + m\angle KHJ$	4. Substitution property
6. $\angle GHK$ is supplementary to $\angle KHJ$	6. If the sum of two angles is 180° , then the angles are supplementary (definition of supplementary)

8.

STATEMENTS	REASONS
1. \overline{PR} bisects $\angle QPS$	1. Given
2. $\angle CDE$ is a right angle	2. If two lines are perpendicular, then they form a right angle (definition of perpendicular)
3. $m\angle CDE = 90^\circ$	3. If an angle is right angle, then its measure is 90° (definition right angle)
4. $m\angle CDE = m\angle CDF + m\angle FDE$	4. Angle addition postulate
5. $90^\circ = m\angle CDF + m\angle FDE$	5. Substitution property
6. $\angle CDF$ is complementary to $\angle FDE$	6. If the sum of two angles is 90° , then the angles are complementary (definition of complementary)

9.

STATEMENTS	REASONS
1. $\angle MRO$ is complementary to $\angle PRO$	1. Given
2. $m\angle MRO + m\angle PRO = 90^\circ$	2. If two angles are complementary, then their sum is 90° (definition of complementary)
3. $m\angle MRO + m\angle PRO = m\angle MRP$	3. Angle addition postulate
4. $m\angle MRP = 90^\circ$	4. Substitution property
5. $\angle MRP$ is a right angle	5. If the measure of an angle is 90° , then it is a right angle (definition of a right angle)



p. 86 #6, 9, 14

6. 32

9. $QS = 12$; $QT = 21$

14. $m\angle B = 57$



p. 91 #2, 6, 10

2. a) 20 b) 16
6. $\angle TNS \cong \angle TRS$ because of the subtraction property
10. 1. Given
2. Given
3. Addition property
4. Given
5. Given
6. Multiplication property



p. 86 #17

17. a) Yes

b) $m\angle ABC = 180^\circ$; $\overrightarrow{BF} \perp \overrightarrow{AC}$

p. 91 #1414. 165° **p. 182 #6, 14, 15**

6. 8 sq units

14. Yes.

15. 45° ; 60° 

p. 79 #1, 4–6, 12, 14, 15, 17, 19–21

1.
 - a) 49
 - b) 131
 - c) 49
 - d) 41
 - e) 139
 - f) 41
 - g) 139

4. 144°
5. 35 and 55
6. $\angle 6 \cong \angle 7$ because of the congruent supplements theorem
12. 40
14.
 - a) $(-10, 0)$
 - b) They are complementary
 - c) 35
15. 37 or 61
17. 165
19. 98
20. $23\frac{2}{23}$ or 37
21. 3:2



p. 105 #7, 9, 11–13, 16a, c, 17, 20a, 28–34

7. 6 cm
9. $\angle 2 \cong \angle 3$ because of the vertical angles theorem
 $\angle 1 \cong \angle 2$ because of the transitive property
11. $\angle ABD \cong \angle CBE$ all right angles are congruent
 $\angle ABE + \angle EBD = \angle ABD$ angle addition postulate
 $\angle CBD + \angle EBD = \angle CBE$ angle addition postulate
 $\angle ABE \cong \angle CBD$ subtraction property (not subtraction property of equality)
12. 62
13. 22.5
- 16a $97^\circ; 7^\circ$
17. $(2, -5); (6, -11)$
- 20a $(0, 8); (6, -5)$
28. $x = 25\frac{5}{7}; y = 51\frac{3}{7}$
29. 50
30. $y = -2x + 10$
31. 110
32. 35
33. a) $x - 2y = y$ or $x = 3y$
b) $y = 124 - x$
c) 31
34. 32

