ge 195 • EXPLORATIONS

trapezoid; The seg. that joins the midpts. of 2 sides of a $\triangle$ is $\parallel$ to the third side; $\square$; (same as above)

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1. $\square$ 2. trapezoid 3. rectangle 4. square 5. 11 6. 17; 67

7.

Statements	Reasons
1. $\angle 1 \cong \angle 2 \cong \angle 3 \cong \angle 4$	1. Given
2. $\overline{HG} \parallel \overline{EF}$; $\overline{HE} \parallel \overline{GF}$	2. If 2 lines are cut by a trans. and alt. int. $\measuredangle$s are $\cong$, then the lines are $\parallel$.
3. $EFGH$ is a $\square$.	3. Def. of $\square$
4. $\overline{HG} \cong \overline{HE}$	4. If 2 $\measuredangle$s of a $\triangle$ are $\cong$, then the sides opp. those $\measuredangle$s are $\cong$.
5. $HGFE$ is a rhombus.	5. If 2 consec. sides of a $\square$ are $\cong$, then the $\square$ is a rhombus.

8. **a.** $\square$

b.

Statements	Reasons
1. $PQRS$ is a $\square$.	1. Given
2. $\overline{PQ} \parallel \overline{SR}$	2. Def. of $\square$
3. X is the midpt. of $\overline{PQ}$; Y is the midpt. of $\overline{SR}$.	3. Given
4. $XQ = \frac{1}{2}PQ$; $YR = \frac{1}{2}SR$	4. Midpt. Thm.
5. $\overline{PQ} \cong \overline{SR}$ or $PQ = SR$	5. Opp. sides of a $\square$ are $\cong$.
6. $\frac{1}{2}PQ = \frac{1}{2}SR$	6. Mult. Prop. of $=$
7. $XQ = YR$	7. Substitution Prop.
8. $XQRY$ is a $\square$.	8. If one pair of opp. sides of a quad. are both $\cong$ and $\parallel$, then the quad. is a $\square$.

c. trapezoid

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110 2. 38 3. 28 4. 6 5. $GS = 5$ or $\overline{SA} \parallel \overline{GN}$ 6. $\angle SAN \cong \angle SGN$ $\overline{AZ} \cong \overline{GZ}$ 8. $GN = 17$ or $\overline{GS} \parallel \overline{NA}$

9. A line that contains the midpt. of one side of a $\triangle$ and is $\parallel$ to another side passes through the midpt. of the third side.

10. The seg. that joins the midpts. of 2 sides of a $\triangle$ is $\parallel$ to the third side.

11. The seg. that joins the midpts. of 2 sides of a $\triangle$ is half as long as the third side.

12.

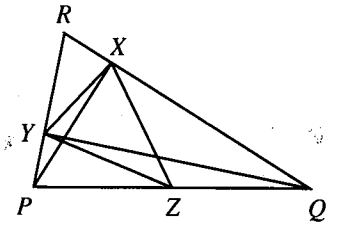
Statements	Reasons
1. $CDEF$ is a $\square$.	1. Given
2. $\overline{FE} \parallel \overline{CD}$	2. Def. of $\square$
3. $\overline{FE} \parallel \overline{CR}$ and $\overline{FS} \parallel \overline{DR}$	3. $\overline{FE} \parallel \overline{CD}$
4. S and T are midpts. of $\overline{EF}$ and $\overline{ED}$.	4. Given
5. $\overline{SR} \parallel \overline{FD}$	5. The seg. that joins the midpts. of 2 sides of a $\triangle$ is $\parallel$ to the third side.
6. $FSRD$ is a $\square$.	6. Def. of $\square$
7. $\overline{SR} \cong \overline{FD}$	7. Opp. sides of a $\square$ are $\cong$.

13. $\square$ **14.** rhombus **15.** rectangle **16.** square

17.

Statements	Reasons
1. $ABCD$ is a rhombus.	1. Given
2. $DO = BO$; $AO = CO$	2. Diags. of a $\square$ bis. each other.
3. $DO = DE + EO$; $BO = BF + FO$	3. Seg. Add. Post.
4. $DE + EO = BF + FO$	4. Substitution Prop.
5. $DE = BF$	5. Given
6. $EO = FO$	6. Subtr. Prop. of $=$
7. $AECF$ is a $\square$.	7. If the diags. of a quad. bis. each other, then the quad. is a $\square$.
8. $\overline{BD} \perp \overline{AC}$	8. Diags. of a rhombus are $\perp$.
9. $\angle COE \cong \angle COF$	9. If 2 lines are $\perp$, then they form $\cong$ adj. $\measuredangle$s.
10. $\overline{CO} \cong \overline{CO}$	10. Refl. Prop.
11. $\triangle COE \cong \triangle COF$	11. SAS Post.
12. $\overline{CE} \cong \overline{CF}$	12. Corr. parts of $\cong$ $\triangle$s are $\cong$.
13. $AECF$ is a rhombus.	13. If 2 consec. sides of a $\square$ are $\cong$, then the $\square$ is a rhombus.

18. Given: $\overline{PX}$ and $\overline{QY}$ are altitudes of $\triangle PQR$; Z is the midpt. of $\overline{PQ}$.
Prove: $\triangle XYZ$ is isos.



Statements	Reasons
1. $\overline{PX}$ and $\overline{QY}$ are altitudes.	1. Given
2. $\overline{PX} \perp \overline{RQ}$; $\overline{QY} \perp \overline{PR}$	2. Def. of altitude
3. $\angle PXQ$ and $\angle PYQ$ are rt. $\measuredangle$s.	3. Def. of $\perp$ lines
4. $\triangle PXQ$ and $\triangle PYQ$ are rt. $\triangle$s.	4. Def. of rt. $\triangle$
5. Z is the midpt. of $\overline{PQ}$.	5. Given
6. $XZ = PZ$ or $\overline{XZ} \cong \overline{PZ}$; $PZ = YZ$ or $\overline{PZ} \cong \overline{YZ}$	6. The midpt. of the hypotenuse of a rt. $\triangle$ is equidistant from the 3 vertices.
7. $\overline{XZ} \cong \overline{YZ}$	7. Trans. Prop.
8. $\triangle XYZ$ is isos.	8. Def. of isos. $\triangle$

19. $\overline{ZO}$, $\overline{DI}$ **20.** 14 **21.** 4 **22.** 100

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1. always **2.** sometimes **3.** sometimes **4.** always **5.** sometimes **6.** never

7. always **8.** sometimes **9.** 28 **10.** 4.5 **11.** $7j + 2k$

12. Yes; if both pairs of opp. $\measuredangle$s of a quad. are $\cong$, then the quad. is a $\square$.

13. Yes; if one pair of opp. sides of a quad. are both $\cong$ and $\parallel$, then the quad. is a $\square$.

14. Yes; if the diags. of a quad. bisect each other, then the quad. is a $\square$.

15. Yes; if both pairs of opp. sides of a quad. are $\cong$, then the quad. is a $\square$.

16. 14; 15; 26

17. $5x - 4 = 3(x + 4)$, $x = 8$; $6y + 2 = 2y^2 - 6$, $y = 4$; $z = \frac{1}{2}(54 + 30) = 42$

18.

Statements	Reasons
1. $PQRS$ is a $\square$.	1. Given
2. $\overline{PS} \cong \overline{QR}$	2. Opp. sides of a $\square$ are $\cong$.
3. $\angle P \cong \angle R$	3. Opp. $\measuredangle$s of a $\square$ are $\cong$.
4. $PA = RB$ or $\overline{PA} \cong \overline{RB}$	4. Given
5. $\triangle PAS \cong \triangle RBQ$	5. SAS Post.
6. $\overline{AS} \cong \overline{BQ}$ or $AS = BQ$	6. Corr. parts of $\cong$ $\triangle$s are $\cong$.

19.

Statements	Reasons
1. $\overline{PR} \parallel \overline{VO}; \overline{RO} \parallel \overline{PV}$	1. Given
2. $PROV$ is a $\square$.	2. Def. of $\square$
3. $\overline{PR} \cong \overline{RO}$	3. Given
4. $PROV$ is a rhombus.	4. If 2 consec. sides of a $\square$ are $\cong$, then the $\square$ is a rhombus.
5. $\overline{RE} \cong \overline{EV}$	5. The diags. of a $\square$ bis. each other.
6. $\overline{EO} \cong \overline{EO}$	6. Refl. Prop.
7. $\overline{RO} \cong \overline{VO}$	7. Def. of rhombus
8. $\triangle ROE \cong \triangle VOE$	8. SSS Post.
9. $\overline{OE} \perp \overline{RV}$	9. The diags. of a rhombus are $\perp$.
10. $\angle VEO$ is a rt. $\angle$.	10. Def. of $\perp$ lines
11. $\triangle VEO$ is a rt. $\triangle$.	11. Def. of rt. $\triangle$
12. $\angle 1$ and $\angle VOE$ are comp.	12. The acute $\measuredangle$s of a rt. $\triangle$ are comp.
13. $m\angle 1 + m\angle VOE = 90$	13. Def. of comp. $\measuredangle$s
14. $\angle 2 \cong \angle VOE$ or $m\angle 2 = m\angle VOE$	14. Corr. parts of $\cong$ $\triangle$s are $\cong$.
15. $m\angle 1 + m\angle 2 = 90$	15. Substitution Prop.
16. $\angle 1$ and $\angle 2$ are comp.	16. Def. of comp. $\measuredangle$s

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A **1.** one **2. a.** yes; skew lines **b.** no

3. If you enjoy winter weather, then you are a member of the skiing club.

4. -1 **5.** Trans. Prop.

6. 180; The sum of the meas. of the $\measuredangle$s of a $\triangle$ is 180. **7.** 180; $\angle$ Add. Post.

8. 5; The meas. of an ext. $\angle$ of a $\triangle$ equals the sum of the meas. of the 2 remote int. $\measuredangle$s.

9. $\angle 1$; If 2 $\parallel$ lines are cut by a trans., then corr. $\measuredangle$s are $\cong$.

10. $\overline{EB}$; If 2 $\measuredangle$s of a $\triangle$ are $\cong$, then the sides opp. those $\measuredangle$s are $\cong$.

11. bisects; $\perp$ **12. a.** A and B **b.** $\overrightarrow{SR}$ and $\overrightarrow{ST}$

13. a. $\triangle RTA$ **b.** $\overline{DB}$ **c.** $m\angle E$ **14.** $\dfrac{38(180)}{40} = 171$ **15.** 150, 150

B **16.** $2x + 7 = 4x - 1; 2x = 8; x = 4; SU = 2(4) + 7 = 15; UN = 4(4) - 1 = 15;$
$SN = 3(4) + 4 = 16$

17. $MN = \dfrac{1}{2}[(2r + s) + (4r - 3s)] = \dfrac{1}{2}(6r - 2s) = 3r - s$

18. median **19.** bisector **20.** isos.

21. $m\angle DAC + 2m\angle ADC = 180, 36 + 2m\angle ADC = 180, 2m\angle ADC = 144,$
$m\angle ADC = 72; m\angle ADF = \dfrac{1}{2}(72) = 36$