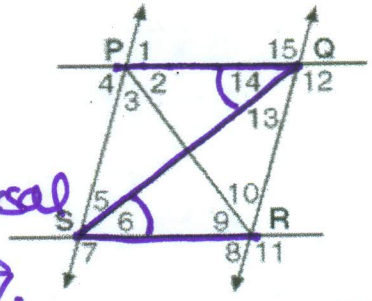
Name _____

Date _____ Period _____

Geometry
Unit 6 Practice Test

1. If $\angle 14 \cong \angle 6$ can be used to show that two lines are parallel,



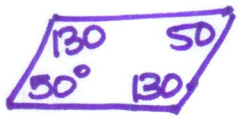
(a) Name the parallel lines

PQ // SR

(b) State the theorem

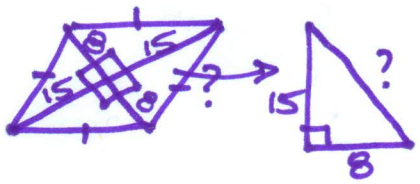
If 2 lines are cut by a transversal & alt. int. ∠'s are ≅, the lines are //.

2. The measures of one angle of a parallelogram is 50°. What are the measures of the other angles?



50°
130°
130°

3. The diagonals of a rhombus are 30 and 16.



(a) Find the measure of a side of the rhombus.

$15^2 + 8^2 = c^2$

$289 = c^2$

$c = 17$

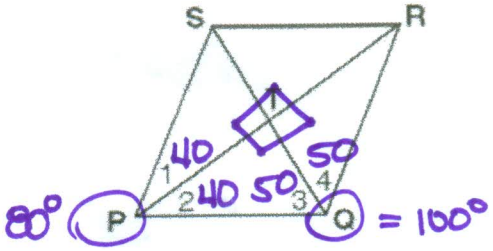
17

(b) Find the perimeter of the rhombus.

17+17+17+17 = 68

4. In the accompanying diagram, PQRS is a rhombus with diagonals $\overline{PR}$ and $\overline{SQ}$. If $m\angle 1 = 40°$, find the $m\angle PQR$.

$\angle PQR = 100°$

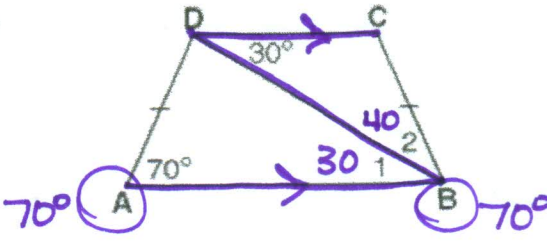


5. ABCD is an isosceles trapezoid with $\overline{AB} \parallel \overline{CD}$ and $\overline{AD} \cong \overline{BC}$.

Find $m\angle 1$ and $m\angle 2$.

$\angle 1 = 30°$

$\angle 2 = 40°$

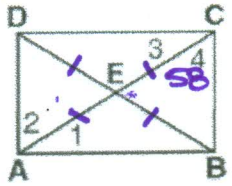


6. What is the perimeter of a square whose diagonal measures $11\sqrt{2}$?

side = 11

Perimeter = 44

Questions 7 and 8 refer to the following diagram. ABCD is a rectangle with diagonals $\overline{AC}$ and $\overline{BD}$.



7. If AC = 8x – 6 and DB = 7x – 2, find the value of x.

$\overline{AC} \cong \overline{DB}$

$8x-6=7x-2$

$x-6=-2$

$x=4$

8. If $m\angle 4 = 58°$, find the $m\angle EBC$.

$\angle EBC = 58°$

9. Factor completely:

a. $3x^2 - 15x - 42$

$3(x^2-5x-14)$ m -14, a -5 → -7, 2

$3(x-7)(x+2)$

b. $5n^2 - 80$

$5(n^2-16)$

$5(n+4)(n-4)$

c. $2x^2 - 5x - 3$

m -6, a -5 → -6, 1

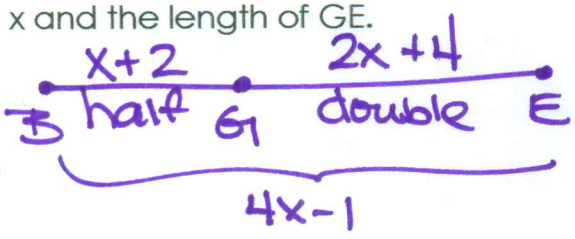
$2x^2-6x+1x-3$

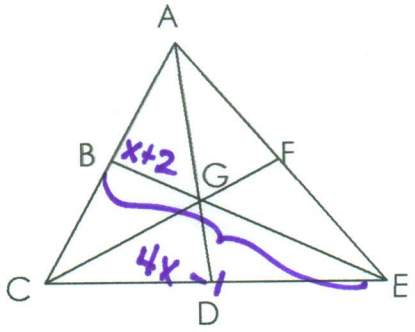
$2x(x-3)+1(x-3)$

$(x-3)(2x+1)$

10. In the diagram below, point G is the centroid of ΔACE. If BE = 4x – 1 and BG = x + 2,

Find x and the length of GE.





$x+2+2x+4=4x-1$

$3x+6=4x-1$

$6=x-1$

$x=7$

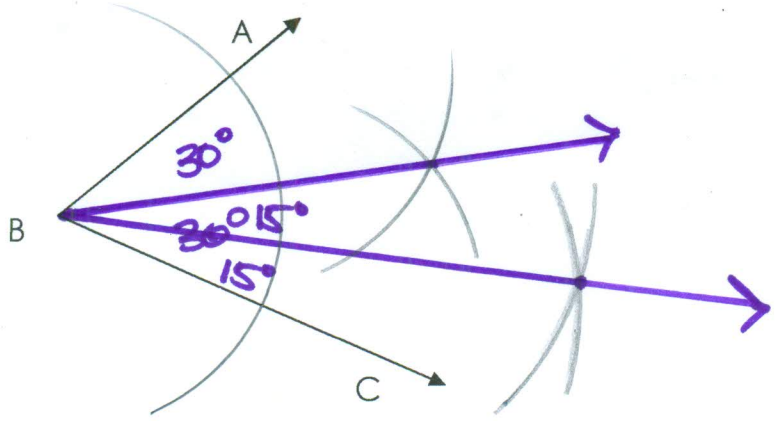
$GE = 18$

11. Which is an example of a quadrilateral whose diagonals are congruent but do not bisect each other?

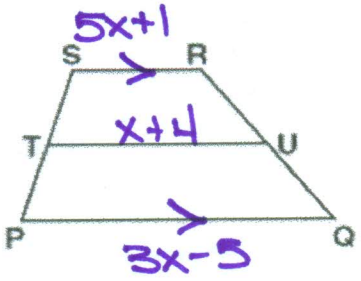
(1) Rhombus (2) Isosceles trapezoid (3) Rectangle (4) Square

12. Given: $m\angle ABC = 60$.

a. Using a compass and straight edge, construct a 30 degree angle.
b. Construct a 15 degree angle.



13. In the diagram below, PQRS is a trapezoid with $\overline{SR} \parallel \overline{PQ}$. $\overline{TU}$ is the median. If SR = 5x + 1, PQ = 3x – 5, and TU = x + 4, what is the length of $\overline{SR}$?



$$\frac{5x+1+3x-5}{2} = x+4$$

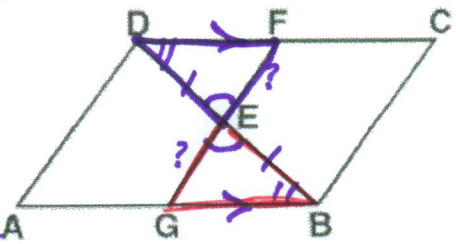
$$\frac{8x-4}{2} = x+4$$

$$8x-4 = 2x+8$$

$$6x-4=8$$
$$6x=12$$
$$x=2$$

$SR = 11$

14. **Given:** ABCD is a parallelogram
$\overline{FG}$ bisects $\overline{DB}$
Prove: $\overline{FE} \cong \overline{EG}$

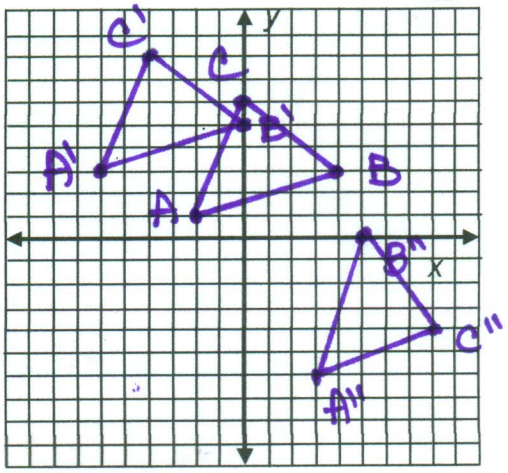


Statements	Reasons
1. ABCD is a //ogram, FG bisects DB	1. Given
2. $\overline{DE} \cong \overline{BE}$	2. Def. of a segment bisector.
3. $\angle FED \cong \angle BEG$	3. Vertical ∠'s are ≅.
4. $\overline{DC} \parallel \overline{AB}$	4. In a //ogram, opp. sides are //.
5. $\angle CDB \cong \angle ABD$	5. If 2 // lines are cut by a transversal, alt. int. ∠'s are ≅.
6. $\triangle FED \cong \triangle GEB$	6. ASA
7. $\overline{FE} \cong \overline{EG}$	7. CPCTC

1st

15. The coordinates of ΔABC are A(-2, 1), B(4, 3) and C(0, 6).
Graph and state the coordinates of $\Delta A''B''C''$, the image of ΔABC after the composition $r_{y=x} \circ T_{-4,2}$

A (-2,1) → A' (-6, 3) → A'' (3,-6)
B (4,3) → B' (0, 5) → B'' (5,0)
C (0,6) → C' (-4, 8) → C'' (8,-4)



16. The measures of the interior and exterior angles of a polygon are in a ratio of 4 : 5. What is the measure of the interior angle?

4x / 5x

$4x + 5x = 180$
$9x = 180$
$x = 20$

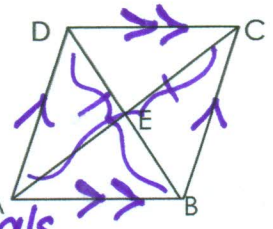
$4(20) = 80°$

17. If two supplementary angles have a ratio of 9:11, find the measure of the smaller angle.

$9x + 11x = 180$
$20x = 180$
$x = 9$

$9(9) = 81°$

18. If $\overline{AD} \parallel \overline{BC}$, $\overline{DC} \parallel \overline{AB}$, and $\overline{AC} \cong \overline{DB}$ determine which quadrilateral(s) can be proven? Explain.



//ogram b/c 2 pairs of opp. sides //.
trapezoid b/c it's a //ogram.
rectangle b/c it's a //ogram with ≅ diagonals
isosceles trapezoid b/c it's a rectangle.

19. True or False:
a. Every square is a rectangle. TRUE
b. Every parallelogram is a trapezoid. TRUE
c. Every rectangle is a square. FALSE
d. Every isosceles trapezoid is a rectangle. FALSE

20. Which of the following is a correct method of proving a figure is a rhombus.

(1) If a quad has 2 pairs of opposite sides parallel and congruent diagonals, then it is a rhombus. – Rectangle

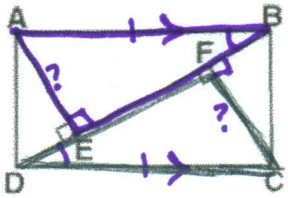
(2) If a quad has one pair of opposite sides parallel and congruent and 1 right angle, then it is a rhombus. – Rectangle

(3) If a quad has 2 pair of opposite sides congruent and diagonals that are perpendicular, then it is a rhombus. – Rhombus

(4) If a quad has 2 pair of opposite sides parallel and diagonals that bisect each other, then it is a rhombus. – ||ogram

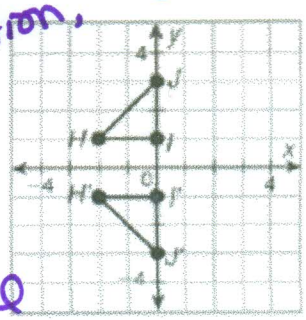
21. Given: Rectangle ABCD with diagonal $\overline{BFED}$, $\overline{AE} \perp \overline{BD}$, $\overline{CF} \perp \overline{BD}$

Prove: $\overline{AE} \cong \overline{CF}$



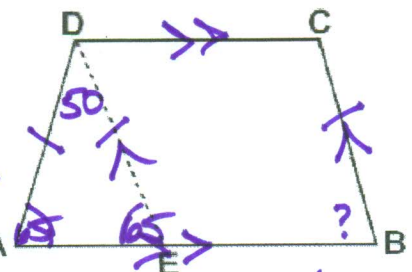
Statements	Reasons
1. Rectangle ABCD, $\overline{AE} \perp \overline{BD}$, $\overline{CF} \perp \overline{BD}$	1. Given
2. $\angle AEB$ & $\angle CFD$ are right $\angle$'s	2. Def. of $\perp$ lines.
(A) 3. $\angle AEB \cong \angle CFD$	3. All right $\angle$'s are $\cong$.
(S) 4. $\overline{AB} \cong \overline{DC}$	4. In a rectangle, opp. sides are $\cong$.
5. $\overline{AB} \parallel \overline{DC}$	5. In a rectangle, opp. sides are $\parallel$.
6. $\angle ABD \cong \angle CDB$	6. If 2 $\parallel$ lines are cut by a transversal, alt. int. $\angle$'s are $\cong$.
7. $\triangle ABE \cong \triangle CDF$	7. AAS
8. $\overline{AE} \cong \overline{CF}$	8. CPCTC

22. In the diagram below, $\triangle HIJ$ and $\triangle H'I'J'$ are graphed. Use the properties of rigid motions to explain why $\triangle HIJ \cong \triangle H'I'J'$.



Under a line reflection, which is a rigid motion, distance & $\angle$ measure (or size & shape) are preserved, therefore the $\triangle$'s $\angle$'s and sides stay the same and the $\triangle$'s are $\cong$.

23. In the accompanying diagram, ABCD is an isosceles trapezoid with $\overline{DE} \parallel \overline{CB}$. Find the measure of $\angle EBC$ if $m\angle ADE = 50$. Explain your reasoning.



* DCBE is a ||ogram, so opp. sides are also $\cong$ ... $AD \cong CB \cong DE$

* $\angle DAE \cong \angle DEA$ b/c $\angle$'s across from $\cong$ sides are $\cong$.

180 − 50 / 130/2 = 65

* Base $\angle$'s are $\cong$ in an isosceles trapezoid.