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Adv Geo – Per   DATE

Parallel Lines and Related Figures (chapter 5) Practice Test

The actual test will be tomorrow. There will be 2 always-sometimes-never problems, 7 "best description" of quadrilateral problems, 4 algebra problems <u>with reasons</u>, 4 fill-in proofs, 2 multiple-choice proofs. Again, geometry requires you to explain WHY something is or is not true.

Part I (5 points)

In problems 1–5, choose the correct answer.

1   Which of the following are equiangular quadrilaterals?
   a   parallelogram and rectangle
   b   trapezoid and rhombus
   c   square and rhombus
   d   square and rectangle
   e   none of these   1 _____
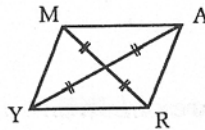
2   If two parallel lines are cut by a transversal,
   then the bisectors of a pair of interior angles
   on the same side of the transversal are __?__.
   a ∥   **b** ∦   **c** ⊥   **d** supplementary
   e   complementary   2 _____

3   What is the most descriptive
   name for quadrilateral MARY?
   a   parallelogram   **b**   rectangle
   c   rhombus   **d**   square
   e   kite   3 _____

4   Which of the following statements is *not* always true?
   a   The diagonals of an isosceles trapezoid
      are congruent.
   b   The diagonals of a parallelogram bisect
      the angles of the parallelogram.
   c   The diagonals of a kite divide it into
      four right triangles.
   d   The diagonals of a rhombus divide it into
      four congruent right triangles.
   e   The diagonals of a square divide it into
   four congruent isos. rt. triangles.   4 _____

5   Which of the following is *not* sufficient to
   prove a quadrilateral a paralleogram?
   a   Show opposite sides parallel.
   b   Show opposite angles congruent.
   c   Show opposite sides congruent.
   d   Show one pair of opposite sides
      congruent and one pair of opposite sides ∥.
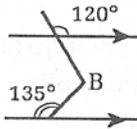   **e**   Show the diagonals bisect each other.   5 _____

Part II (17 points)

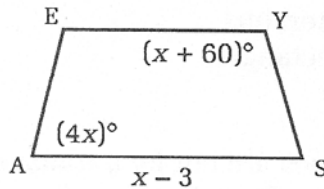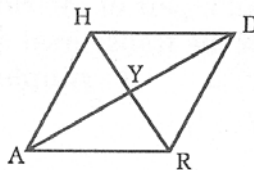**6** Write a valid inequality and find the restrictions on x.

$(5x - 10)°$ \qquad $20°$

6 _____

7 Find $m\angle B$.

$120°$
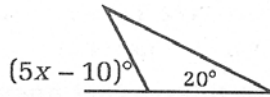
$135°$ $\angle B$

7 _____

8 EASY is an isosceles trapezoid with bases $\overline{EY}$ and $\overline{AS}$. Find $\overline{AS}$.

E \qquad Y

$(x + 60)°$

$(4x)°$

A \qquad $x - 3$ \qquad S

8 _____

9 HARD is a rhombus with perimeter 52 and $\angle HAR = 60°$. Find $\overline{HY}$.

H \qquad D

Y

A \qquad R

9 _____

10 KITE is a kite.
$\angle 1 = 6x$
$\angle 2 = x + 20$
Find the measure of $\angle IKE$.

I \qquad K

2

1

T \qquad E
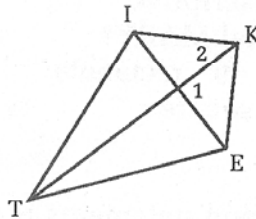
10 _____

Solve problems 11 and 12 by referring to the diagram and the information given.

STOP is a rhombus.

S \qquad P (11, 6)

y

T \qquad V \qquad O (8, 2)

(3, 2) \qquad x

11 Find the coordinates of V.
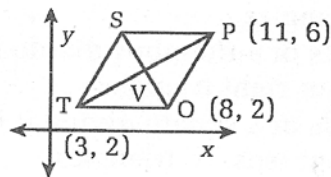
11 _____

12 Find the slope of $\overline{SO}$.

12 _____

13 $p \parallel q$
$\angle 1 = 2x + 20$
$\angle 2 = 3x - 50$
Find the measure of $\angle 3$.

3 / 1 / 2 \qquad t
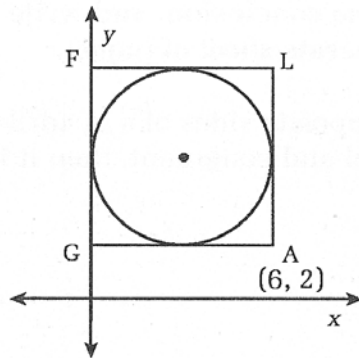
p \qquad q
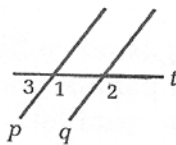
13 _____

Solve problems 14–16 by referring to the diagram and the information given.

FLAG is a square with a circle inscribed within.

14   Find the coordinates of the center of the circle.

14 _____

15   Find the circumference of the circle, correct to the nearest hundredth.

15 _____

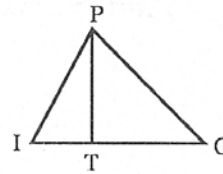16   Which has the greater perimeter, the circle or the square?

16 _____

Part III (28 points)

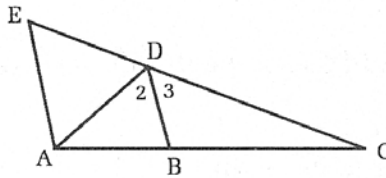**In problem 17, write an indirect paragraph proof.**

17   Given: $\triangle$PIG is scalene.
              $\overline{PT}$ is the altitude to $\overline{IG}$.
     Prove: $\overline{PT}$ is not the median to $\overline{IG}$.

17 _____

_____

In problems 18 and 19, write a two-column proof. Use a separate sheet of paper.

18   Given: $\overline{AE} \parallel \overline{BD}$
              $\angle 2 \cong \angle 3$
     Prove: $\triangle$EAD is isos.

19 Given: AFCE is a □.
          ∠DAF ≅ ∠BCE
    Prove: ABCD is a □.
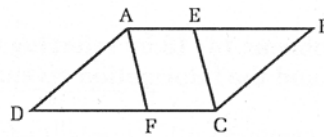
In problem 20, draw a diagram, state both what is given and the conclusion, and write the proof. Use a separate sheet of paper.

20 If one pair of opposite sides of a quadrilateral are both parallel and congruent, then it is a parallelogram.

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9 BE ≅ CF / CPCTC   10 AE ≅ CF / Same as 7   11 AB ≅ CD / Addition
[9, 10]   12 ABCD is a □. / If one pair of opposite sides of a quad. are
both ≅ and ∥, then it is a □.
30 Given: AB ≅ CD
          AB ∥ CD
    Prove: ABCD is a □.
1 Draw BD. / Two points determine a line.   2 AB ∥ CD / Given
3 ∠ABD ≅ ∠CDB / ∥ lines ⇒ alt. int. ∠s ≅.   4 AB ≅ CD / Given
5 BD ≅ BD / Reflexive   6 △ABD ≅ △CDB / SAS [4, 3, 5]
7 ∠BDA ≅ ∠DBC / CPCTC   8 AD ∥ BC / Alt. int. ∠s ≅ ⇒ ∥ lines.
9 ABCD is a □. / If the opposite sides of a quad are ∥, then it is a □.

Chapter 5 Parallel Lines and Related Figures

Part I (5 points)
1 d   2 c   3 b   4 b   5 d

Part II (17 points)
6 6 < x < 38   7 105°   8 21   9 13/2   10 70°   11 (7, 4)
12 −2   13 20°   14 (3, 5)   15 18.85   16 square

Part III (28 points)
17 Assume PT is the median to TC. Then PT ≅ TC. Since PT is the altitude
to TC, then ∠PTI and ∠PTG are congruent right ∠s. Since PT ≅ PT, then
△PTI ≅ △PTG by SAS. Then PI ≅ PG by CPCTC, which makes △PIG
isos. But △PIG is scalene. Thus, the assumption is false and PT is not
the median to TC.   18 1 AE ∥ BD / Given   2 ∠EAD ≅ ∠2 / ∥ lines ⇒
alt. int. ∠s ≅.   3 ∠E ≅ ∠3 / ∥ lines ⇒ corr. ∠s ≅.   4 ∠2 ≅ ∠3 /
Given   5 ∠EAD ≅ ∠E / Transitive   6 △EAD is isos. / If a △ contains
two ≅ ∠s, then it is isosceles.   19 1 AFCE is a □. / Given
2 AE ∥ CF, EC ∥ AF / The opposite sides of a □ are ∥.   3 ∠BEC ≅ ∠EAF /
∥ lines ⇒ corr. ∠s ≅.   4 ∠EAF ≅ ∠DFA / ∥ lines ⇒ alt. int. ∠s ≅.
5 ∠BEC ≅ ∠DFA / Transitive   6 ∠DAF ≅ ∠BCE / Given   7 AF ≅ CE /
The opposite sides of a □ are ≅.   8 △AFD ≅ △CEB / ASA (5, 7, 6)