

Year 9 Term 3 Homework

Student Name: _____	Grade: _____
Date: _____	Score: _____

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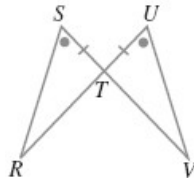
6 Year 9 Term 3 Week 6 Homework

6.1 Geometry

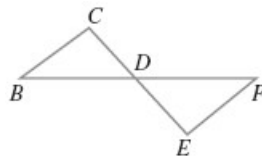
6.1.1 Tests for congruent triangles

Exercise 6.1.1

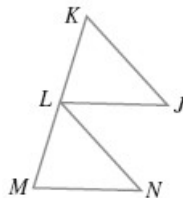
1. Prove that $\triangle RST \cong \triangle TUV$.



2. If CE and BF bisect each other, prove that $\triangle BCD \cong \triangle DEF$.



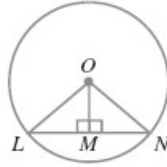
3. In the given figure $LJ \parallel MN$, $KJ \parallel LN$ and LJ bisects KM. Prove that $\triangle KLJ \cong \triangle LMN$.



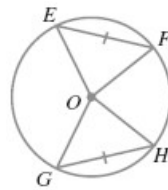
6.1.2 Congruence proofs

Exercise 6.1.2

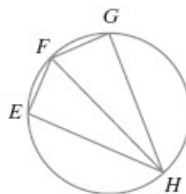
1. O is the centre of the circle. Prove that $\triangle OLM \equiv \triangle OMN$.



2. O is the centre of the circle. Prove that $\triangle EFO \equiv \triangle GOH$.



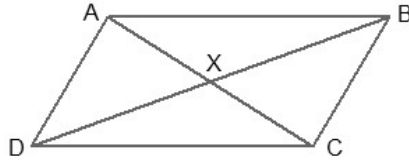
3. Given that $FE \perp EH$, $FG \perp GH$ and $EH = GH$. Prove that $\triangle FEH \equiv \triangle FGH$.



6.1.3 Deductive reasoning and congruent triangles

Exercise 6.1.3

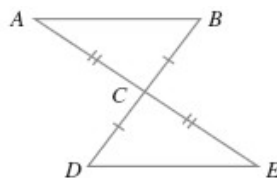
1. *ABCD is a parallelogram. The diagonals AC and BD intersect at x.*



(a) *Prove that $\triangle AXD \equiv \triangle CXB$.*

(b) *Hence, show that the diagonals of a parallelogram bisect each other.*

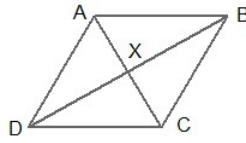
2. *AE and BD bisect each other.*



(a) *Prove that $\triangle ABC \equiv \triangle DCE$.*

(b) *Hence, prove that $AB \parallel DE$.*

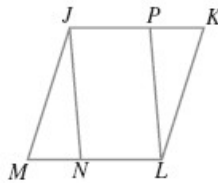
3. $ABCD$ is a rhombus. The diagonals intersect at x .



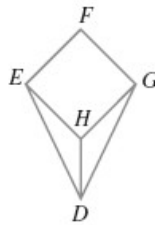
(a) Prove that $\triangle AXB \equiv \triangle BXC$.

(b) Hence, show that the diagonals of a rhombus are perpendicular.

4. $JKLM$ is a rhombus and $MN = PK$. Prove that $\triangle JMN \equiv \triangle LKP$.



5. $EFGH$ is a rhombus and $DE = DG$. Prove that $\triangle DEH \equiv \triangle DGH$.



6.2 Quiz 1

1. Complete the following statements:

(a) Vertically opposite angles are _____ [2]

(b) Complementary angles add up to _____ [2]

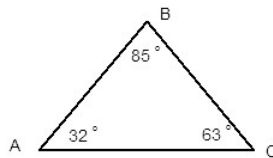
(c) Supplementary angles add up to _____ [2]

(d) Alternate angles are _____ [2]

(e) Corresponding angles are _____ [2]

(f) Co-interior angles are add up to _____ [2]

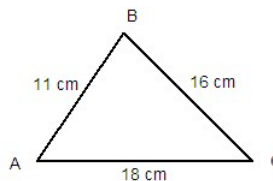
2. Name the longest and shortest sides of the given figure:



(a) Longest side: _____ [2]

(b) Shortest side: _____ [2]

3. Name the smallest and largest angles in the following figure:



(a) Smallest angle: _____ [2]

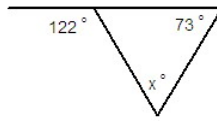
(b) Largest angle: _____ [2]

4. Can a triangle with sides 23 cm, 51 cm and 26 cm possibly exist? Explain. [4]

5. Find the value of the pronumeral in each of the following figures, giving brief reasons.

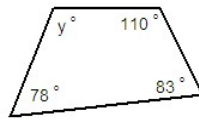
(a) $x =$ _____

[5]



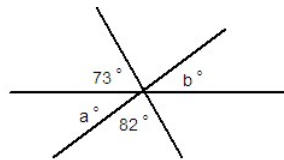
(b) $y =$ _____

[5]



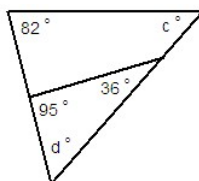
(c) $a =$ _____ , $b =$ _____

[5]



(d) $c =$ _____ , $d =$ _____

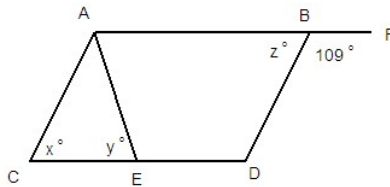
[5]



6. Find the values of the pronumerals in each of these, giving brief reasons.

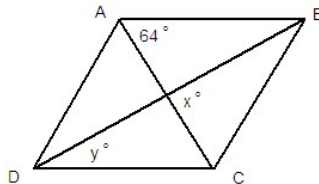
(a) If ABCD is a parallelogram and AC = AE

[5]



(b) ABCD is a rhombus.

[5]



7. Calculate the interior angle sum of each of these regular polygons, then find the size of their interior angles:

(a) decagon

[4]

(b) nonagon

[4]

8. Find the size of the exterior angles in a regular:

(a) pentagon

[4]

(a) _____

(b) dodecagon

[4]

(b) _____

9. Find the size of the interior and exterior angles in a regular polygon with 18 sides.

[5]

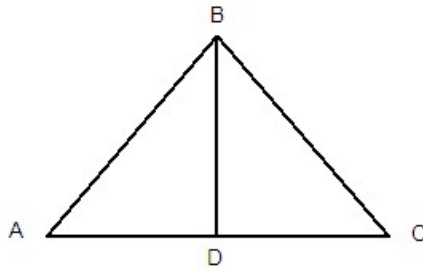
9. _____

10. How many different triangles can be formed if each with sides of length a whole number of centimetres and each with perimeter of 15 cm?

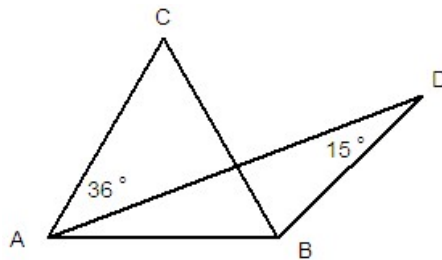
[5]

10. _____

11. For the given figure $AB = BC$ and BD bisects AC . Prove that $\triangle ABD \cong \triangle CBD$, hence prove that $BD \perp AC$ [10]



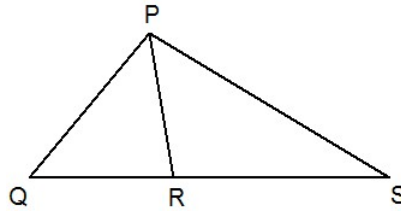
12. Given $AC = CB$, $AB = BD$, find the $\angle ACB$, giving reasons. [10]



6.3 Math Challenge

Exercise 6.3.1

1. In the diagram shown below $PQ : PR = QS : RS$, $\angle PQR = 36^\circ$ and $\angle PRQ = 48^\circ$. Find the $\angle RPS$ in degrees.



2. Simplify the following, giving your answers in the lowest terms:

(a) $\frac{3xy-2y-12x+8}{8-10x-3x^2}$

(b) $\frac{6x^2+7x-5}{9x^2-25} \div \frac{2x^3-x^2}{3x}$

(c) $\frac{2x^2-x-3}{12x} \div \frac{4x^2-9}{6x^2+9x}$

6.4 Miscellaneous exercise**Exercise 6.4.1**

1. 51 men working 8 hours a day, are needed to finish a project. If 3 men are unable to report for work, how long should the rest work a day to finish the project on time?

2. The sum of the interior angles of a regular polygon of n sides is 10 right angles. Find the value of n .

3. A given line of the sequence is as follows:

$$2 + 6 + 10 + 14 + \dots + p = 512 = 2 \times q^2$$

Find the value of p and q .

4. Simplify $\frac{1}{2(x-3)} + \frac{1}{3x-1}$.

5. Find the value of a and b in the identity $ax(2x - b) = 2x(x + 1)$
