

## Year 8 Term 2 Homework

<b>Student Name:</b> _____	<b>Grade:</b> _____
<b>Date:</b> _____	<b>Score:</b> _____

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This edition was printed on June 20, 2014 with worked solutions.  
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## 8 Year 8 Term 2 Week 8 Homework

### 8.1 Topic 1 — Probability

#### 8.1.1 Multi-Stage Experiments

##### Exercise 8.1.1 Further applications

1. A box contains six discs numbered 1, 2, 3, 4, 5, and 6.

(a) Two numbers are drawn in succession, without replacement. What is the probability that both are odd?

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(b) Three numbers are drawn in succession without replacement. What is the probability of drawing even, odd and even numbers in that order?

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(c) Three numbers are drawn in succession without replacement. What is the probability that they are even?

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2. From a room of ten people, five are chosen at random to be seated on the balcony for dinner. What is the probability that Jane and Bonnie both sit on the balcony?

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3. Ray is sending Christmas cards to ten friends. He has two cards with Christmas trees, two with angels, two with snow, two with reindeer and two with Santa Claus. What is the probability that John and Bob get the same cards?

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4. A coin and a die are tossed. Find the probability of obtaining a number less than five and a head.

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## 8.2 Topic 2 — Angles

### 8.2.1 Adjacent Angles

- Adjacent angles: Two angles are adjacent if they have a common vertex and have a common ray.
- Complementary angles: Two adjacent angles are complementary if together they form a right angle. ( $\alpha + \beta = 90^\circ$ ).
- Supplementary angles: Two adjacent angles are supplementary if together they form a straight angle. ( $\alpha + \beta = 180^\circ$ ).

#### Exercise 8.2.1 Find the complementary of:

1.  $60^\circ$  \_\_\_\_\_
2.  $32^\circ$  \_\_\_\_\_
3.  $47^\circ$  \_\_\_\_\_
4.  $58^\circ$  \_\_\_\_\_

#### Exercise 8.2.2 Find the supplementary of:

1.  $160^\circ$  \_\_\_\_\_
2.  $125^\circ$  \_\_\_\_\_
3.  $150^\circ$  \_\_\_\_\_
4.  $54^\circ$  \_\_\_\_\_

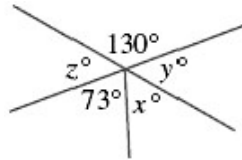
#### Exercise 8.2.3 Further applications

1. Find one-third of the supplement of  $30^\circ$  \_\_\_\_\_
2. Find the complement of the supplement of  $108^\circ$  \_\_\_\_\_
3. Find the supplement of the complement of  $32^\circ$  \_\_\_\_\_
4. Find two-thirds the complement of the supplement of  $150^\circ$  \_\_\_\_\_

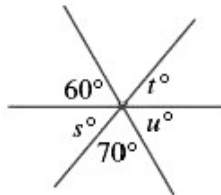
**8.2.2 Vertically Opposite Angles**

- Angles at a point: The sum of the angles drawn from a common point is  $360^\circ$
- Two equal angles lie opposite each other and are vertically opposite angles.

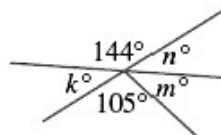
**Exercise 8.2.4 Find the values for all pronumerals in each of the following figures:**



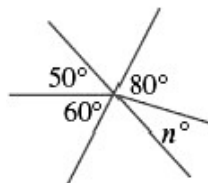
1.  $x =$  \_\_\_\_\_ ,  $y =$  \_\_\_\_\_ ,  $z =$  \_\_\_\_\_ ;



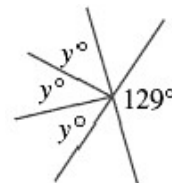
2.  $s =$  \_\_\_\_\_ ,  $t =$  \_\_\_\_\_ ,  $u =$  \_\_\_\_\_ ;



3.  $k =$  \_\_\_\_\_ ,  $m =$  \_\_\_\_\_ ,  $n =$  \_\_\_\_\_ ;



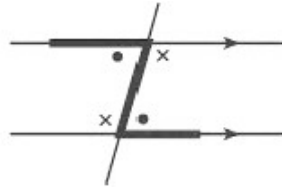
4.  $n =$  \_\_\_\_\_ ;



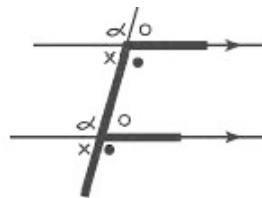
5.  $y =$  \_\_\_\_\_ ;

**8.2.3 Parallel Lines**

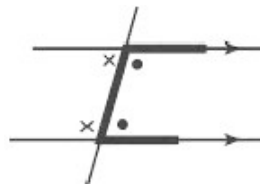
- Alternate angles: lie between the parallel lines and on opposite sides of the transversal and they are equal in size.



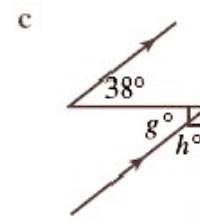
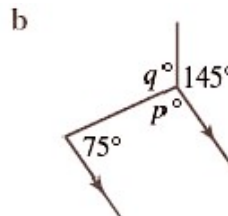
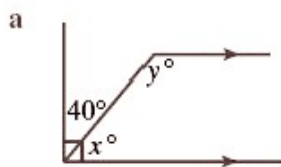
- Corresponding angles: lie on the same side of the parallel lines and on the same side of the transversal and they are equal in size.



- Co-interior angles: lie between the parallel lines and on the same side of the transversal and they are supplementary .



**Exercise 8.2.5 Find the value of the pronumerals in each of the following figures:**



a.  $x =$  \_\_\_\_\_ ,  $y =$  \_\_\_\_\_

b.  $p =$  \_\_\_\_\_ ,  $q =$  \_\_\_\_\_

c.  $g =$  \_\_\_\_\_ ,  $h =$  \_\_\_\_\_

### 8.2.4 Angle sum of a Triangle

The angle sum of a triangle is  $180^\circ$

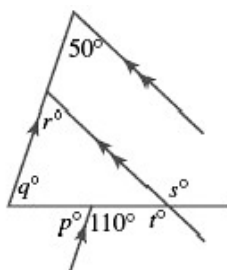
### 8.2.5 Isosceles and equilateral Triangles

An equilateral triangle has 3 equal sides and angles and 3 axes of symmetry. An isosceles triangle has 2 equal sides and angles and only one axis of symmetry.

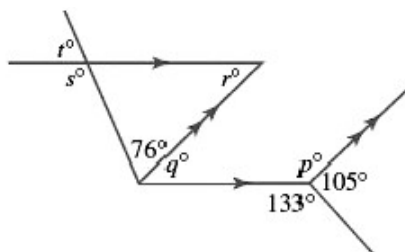
### 8.2.6 Exterior Angle of a triangle

The exterior angle of a triangle is equal to the sum of two interior opposite angles.

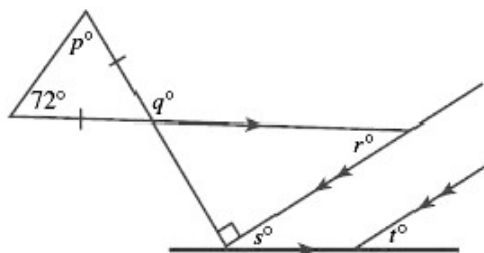
**Exercise 8.2.6 Find the value of all pronumerals for the following figures:**



1.  $p =$  \_\_\_\_\_ ,  $q =$  \_\_\_\_\_ ,  $r =$  \_\_\_\_\_  
 $s =$  \_\_\_\_\_ ,  $t =$  \_\_\_\_\_



2.  $p =$  \_\_\_\_\_ ,  $q =$  \_\_\_\_\_ ,  $r =$  \_\_\_\_\_  
 $s =$  \_\_\_\_\_ ,  $t =$  \_\_\_\_\_

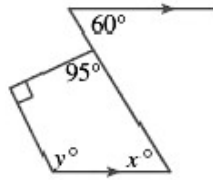


3.  $p =$  \_\_\_\_\_ ,  $q =$  \_\_\_\_\_ ,  $r =$  \_\_\_\_\_  
 $s =$  \_\_\_\_\_ ,  $t =$  \_\_\_\_\_

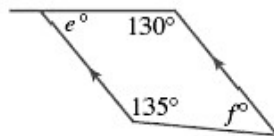
**8.2.7 Angle sum of a quadrilateral**

The angle sum of a quadrilateral is  $360^\circ$  ( $\alpha + \beta + \gamma + \delta = 360^\circ$ )

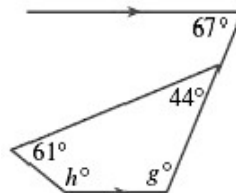
**Exercise 8.2.7 Find the value of the pronumerals in the following figures:**



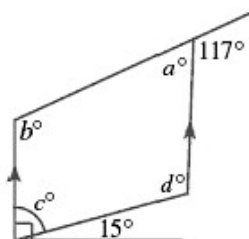
1.  $x =$  \_\_\_\_\_ ,  $y =$  \_\_\_\_\_ ;



2.  $e =$  \_\_\_\_\_ ,  $f =$  \_\_\_\_\_ ;



3.  $g =$  \_\_\_\_\_ ,  $h =$  \_\_\_\_\_ ;



4.  $a =$  \_\_\_\_\_ ,  $b =$  \_\_\_\_\_ ,  $c =$  \_\_\_\_\_ ,  $d =$  \_\_\_\_\_

**8.2.8 The properties of the special quadrilaterals**

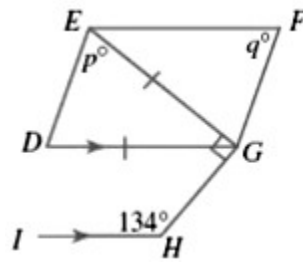
- Square:
  - all sides are equal and all angles are right angles
  - the opposite sides are parallel
  - the diagonals are equal and bisect each other at right angles and the diagonals bisect the angles at the vertices
- Rectangle:
  - the opposite sides are equal
  - all angles are right angles
  - the diagonals are equal and bisect each other
- Parallelogram:
  - the opposite sides are equal and parallel
  - the opposite angles are equal
  - the diagonals bisect each other
- Rhombus:
  - all sides are equal
  - the opposite sides are parallel
  - opposite angles are equal
  - the diagonals bisect each other at right angles and the diagonals bisect the angles at the vertices
- Trapezium: only one pair of opposite sides is parallel
- Kite:
  - two pairs of adjacent sides are equal
  - one pair of opposite angles are equal
  - one diagonal bisects the other at right angles and one diagonal bisects the angles at the vertices

**Exercise 8.2.8 State the following statements true or false.**

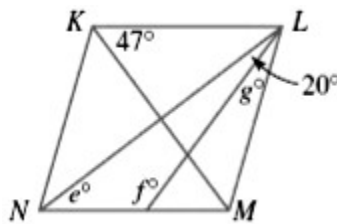
1. A square is a rectangle. \_\_\_\_\_
2. A parallelogram is a rhombus. \_\_\_\_\_
3. A rhombus is a rectangle. \_\_\_\_\_
4. A rhombus is parallelogram. \_\_\_\_\_



Exercise 8.2.9 Find the value of the pronumerals for each of the following figures:

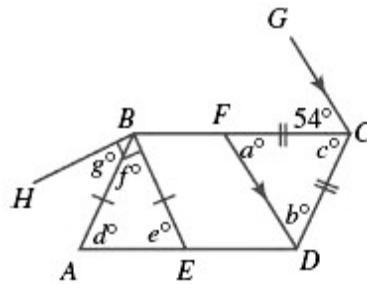


1. *DEFG* is a parallelogram, find  $p =$  \_\_\_\_\_ ,  $q =$  \_\_\_\_\_



2. *KLMN* is a rhombus, find:

$e =$  \_\_\_\_\_ ,  $f =$  \_\_\_\_\_ ,  $g =$  \_\_\_\_\_



3. *ABCD* is a parallelogram and  $CF = CD$  find:

$a =$  \_\_\_\_\_ ,  $b =$  \_\_\_\_\_ ,  $c =$  \_\_\_\_\_ ,  $d =$  \_\_\_\_\_

$e =$  \_\_\_\_\_ ,  $f =$  \_\_\_\_\_ ,  $g =$  \_\_\_\_\_

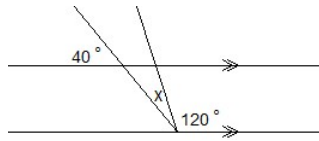
### 8.3 Miscellaneous Exercises

#### Exercise 8.3.1

1. In a  $\triangle CDE$ ,  $CE = DE$ . Which angles are equal? \_\_\_\_\_
2. In  $\triangle XYZ$ ,  $\angle ZXY = \angle ZYX$ . Which sides are equal? \_\_\_\_\_
3. Find the supplement of the complement of  $38^\circ$  \_\_\_\_\_
4. If  $a + b = 12$ ,  $b + c = 17$  and the sum of the three numbers is 22, find the numbers.  
\_\_\_\_\_  
\_\_\_\_\_
5. A square and an equilateral triangle have equal perimeters. If a side of the triangle is 3 cm longer than a side of the square, what is the perimeter of square?  
\_\_\_\_\_  
\_\_\_\_\_
6. In the rhombus  $JKLM$ ,  $N$  is the point of intersection of the diagonals and  $\angle KLN = 63^\circ$ . Find the size of the following angles:
  - (a)  $\angle KNL$  \_\_\_\_\_
  - (b)  $\angle LKN$  \_\_\_\_\_
  - (c)  $\angle JKM$  \_\_\_\_\_
  - (d)  $\angle KLM$  \_\_\_\_\_
  - (e)  $\angle MJL$  \_\_\_\_\_
7. In which of the special quadrilaterals:
  - (a) are the diagonals equal? \_\_\_\_\_
  - (b) are the diagonals perpendicular? \_\_\_\_\_
  - (c) do the diagonals bisect each other? \_\_\_\_\_
  - (d) do the diagonals bisect the angles at the vertices? \_\_\_\_\_

### 8.4 Maths challenge

1. Find the value of  $x$  in the figure shown below:




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2. A woman has three school age children. The product of her age and the ages of her three children is 16555. Find the difference between the age of her eldest and youngest children?

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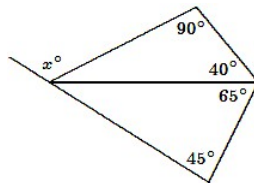


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3. Find the value of  $x$  in the figure shown below:

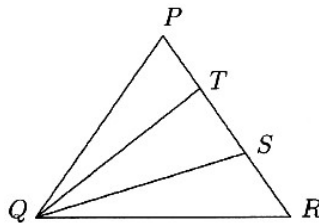



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4. PQR is an equilateral triangle, QS and QT divide  $\angle PQR$  into three equal parts. Find the size of  $\angle QSR$ .




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**Exercise 8.4.1**

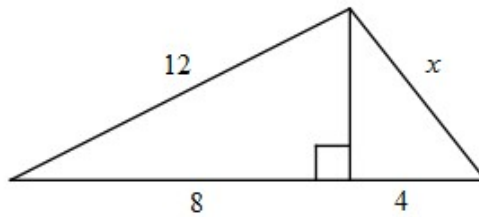
1. If  $\frac{2}{7}$  is expressed as an infinite decimal, what digit would be in the 183<sup>th</sup> decimal place?

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2. Find the exact value of  $x$ :



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**Exercise 8.4.2**

1. Use prime decomposition to express 88935 as a product of its prime factors and express the answer in index form.

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2. Calculate the total number of factor of 9075.

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3. Find the smallest number by which you can multiply by to get a perfect square.

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