UNIVERSITY OF WATERLOO

Faculty of Mathematics
Waterloo, Ontario N2L 3G1

Centre for Education in
Mathematics and Computing

Grade 6 Math Circles

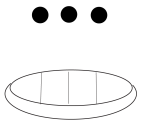
March 29 & 30 2016

Review

Ancient Number Systems

1. What is the ancient Roman symbol for 14?
2. What is the following Babylonian numeral in decimal?

3. What base did the ancient Mayans use?
4. What is the following in decimal?



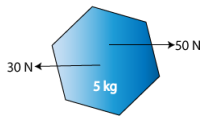
5. Write 603 in Babylonian numerals.

Kinematics

1. What is the difference between a scalar and a vector?
2. Name three vector quantities.
3. When does size of velocity = speed?
4. I walk 2 km [E] in 4 hrs and 700 m [N] in 45 mins. What is my velocity and my speed? Give two decimal places.
5. Give the formula for average acceleration.

Dynamics

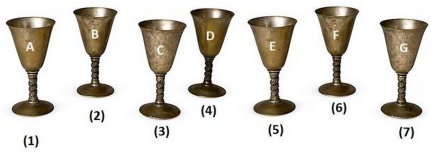
1. What is Newton's second law?
2. Determine the acceleration of the block.



3. What is the difference between weight and mass?
4. What is the purpose of the strong nuclear force?
5. What are the four fundamental forces in order from weakest to strongest?

Modular Arithmetic

1. Was the year 1500 a leap year?
2. Convert 1110001 to decimal.
3. Convert 341 to binary.
4. Anna was facing East and rotated 3195° counterclockwise. Which direction is she facing now?
5. You have 7 goblets one of which is real gold. When you align them and count (back and forth starting with A, B, C, D, E, F, G, F, E, D,) then the golden goblet would be the 1000th one that you count. Which one is the golden goblet?

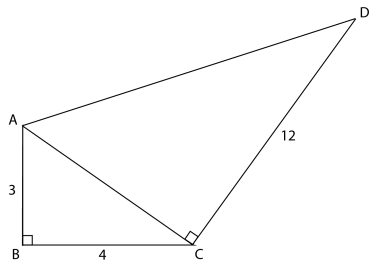


Number Theory

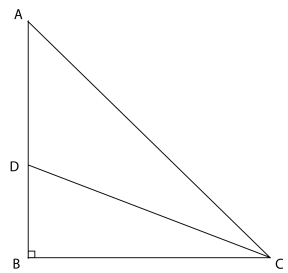
1. What its 98×11?
2. Is 23659254 divisible by 9?
3. Is 59874036 divisible by 11?
4. Is 3652410 divisible by 15?
5. Is 9008868 divisible by 66?

Geometry

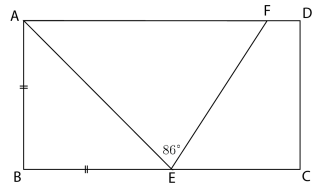
1. In the diagram, find the length AD.



2. In the diagram, $AB = 15$ cm, $DB = 6$ cm, $BC = 8$ cm and $\angle B = 90°$. Find the perimeter of $\triangle ABC$.



3. In the diagram, determine the measure $\angle AFE$.



4. A metrestick leans against a vertical wall with 28 cm between the foot of the metrestick and the base of the wall. If the top of the metrestick slips 16 cm down the wall, how far does the foot of the metrestick slide?

5. Two circles with equal radii are enclosed by a rectangle, as shown. The distance between their centers is $\frac{2x}{3}$. What is the value of x?