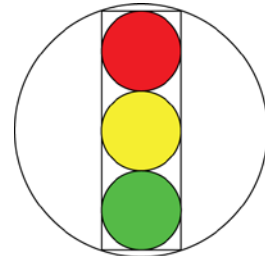


# Grade 10

## EXTRA CHALLENGES - SET II

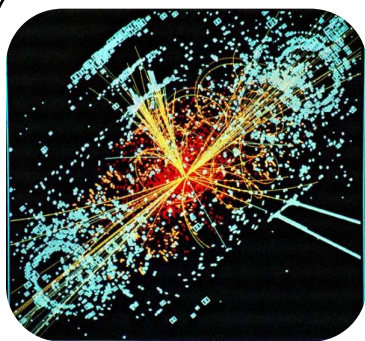
This resource may be copied in its entirety, but is **not to be used for commercial purposes** without permission from the Centre for Education in Mathematics and Computing, University of Waterloo.

1. Three circles, each with a radius of 5 cm, touch each other so that their centres are all in a straight line. These circles are then contained in a rectangle which is inscribed in a circle. What is the radius of large circle?



2. How many integer values of  $x$  satisfy  $\frac{x-2}{5} < \frac{8}{3} < \frac{x+6}{7}$ ?

3. Let  $N$  be the smallest positive integer whose digits have a product of 2160. What is the sum of the digits of  $N$ ?

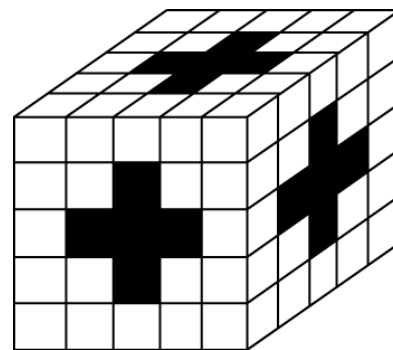


### Did You Know?

The Large Hadron Collider is located between France and Switzerland at a depth ranging from 50 to 175 metres underground. It is the world's largest and highest energy particle accelerator and cost over \$9 billion dollars. It has a circumference of over 27 kilometres! Using the LHC, scientists hope to find new and previously undiscovered subatomic particles.

4. Point P is any point on the line  $y = 3x + 4$ . The coordinates of point Q are (7, 5). If M is the midpoint of PQ, determine the equation of the line that M lies on.

5. In the diagram, a 5 by 5 by 5 cube is made up of 1 by 1 by 1 cubes. The centre squares are removed by punching out the 15 designated columns from front to back, top to bottom, and side to side. How many smaller cubes remain?



Don't forget to try these past contests! Go to [www.wiredmath.ca](http://www.wiredmath.ca) for the link.



### TRY THIS!

Past Cayley and Galois Contests

[http://www.cemc.uwaterloo.ca/contests/past\\_contests.html](http://www.cemc.uwaterloo.ca/contests/past_contests.html)