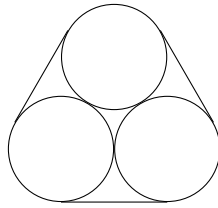


## Set 4 - Team Problems

1. Three pipes with radius 1 are bound together by an iron band. What is the length of the band?



2. A parabola with integer roots passes through the points  $(1,-6)$  and  $(6,44)$ . Find the equation of this parabola.
3. Find the smallest positive integer  $n$  such that  $2n$  is a perfect square,  $3n$  is a perfect cube,  $5n$  is a perfect fifth power.
4. We say that a four-digit integer  $ABCD$  is *amiable* if all four digits are different, and  $ABCD$  is divisible by each of  $A$ ,  $AB$ , and  $ABC$ . For example, 1260 is amiable because all four digits are different, and 1260 is divisible by each of 1, 12, and 126. Find the largest amiable number.

5. Find the sum of the areas of the distinct triangles  $ABC$  which can be formed where  $|AB| = 5$ ,  $|BC| = 8$  and  $\angle BCA = 30^\circ$ .
6. Car  $A$  leaves Halifax and travels to Sydney (passing through Truro) at a constant speed so that the entire trip will take 6 hours. Car  $B$  leaves Truro and travels to Sydney at a constant speed so that their trip will take 8 hours. Car  $C$  leaves Sydney and travels to Truro at a constant speed so that the trip will take 6 hours. All the cars leave at the same time and they all meet at the same point along the route. How long did it take Car  $A$  to get from Halifax to Truro?