**Kwantlen Polytechnic University**

# Mathematics Problem of the Week (248)

## This week's winner is:

## Brady Schmidt

**Contact Lin Hammill (Surrey Fir 348) or Judy Bicep (Richmond,3335) for your prize or email** MathProblem@kpu.ca**.**

## Also submitting correct solutions to problem 248 were:

## Anthony Roberts, Matt Potma, David Luna, and Suzanne Pearce

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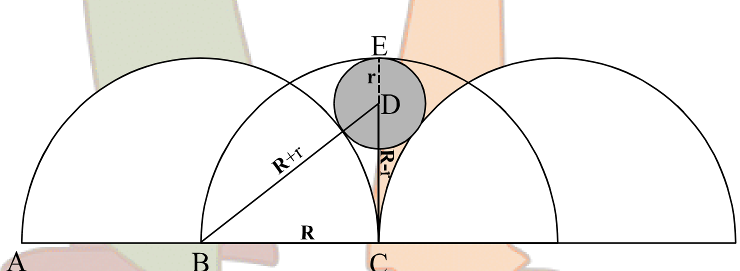
**Problem 248 solution:**




Let R be the radius of the semicircles and r the radius of the circle.
BC is the radius of a semicircle and so is of length R.
Then, since the circle and semicircles are tangent BD is a line segment with length R+r.
CE is the radius of the middle semicircle and so it is of length R. Since DE is of length r, CD is of length R-r.
Applying Pythagoras Theorem to triangle BCD we obtain:

$$R^2 + (R-r)^2 = (R+r)^2$$
$$R^2 + R^2 - 2rR + r^2 = R^2 + 2rR + r^2$$
$$R^2 = 4rR$$
$$R = 4r$$

Thus the ratio is $\frac{r}{R} = \frac{1}{4}$.