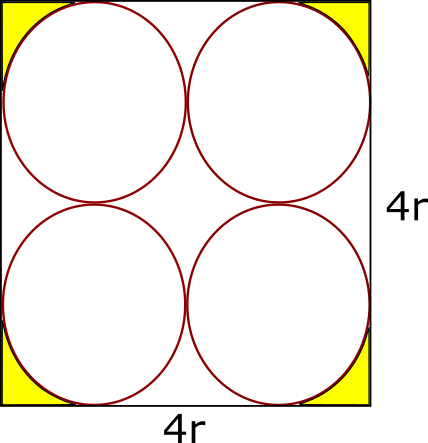
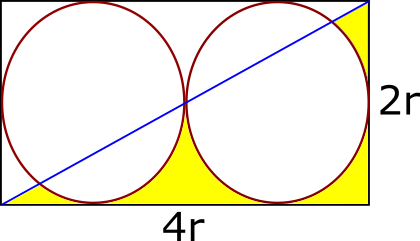
**Mooncakes**

****



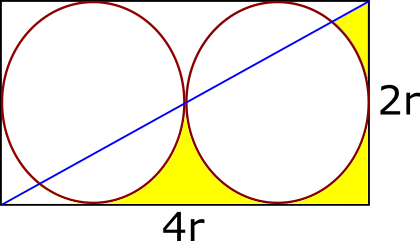
**(a)** A square box of side contains 4 moon-cakes each of radius is shown in the right diagram.

Find the area shaded in yellow in terms of .

**(b)** **(i)** A rectangular moon-cake box contains two moon-cakes, each of radius r.

A diagonal is drawn as shown in the right.

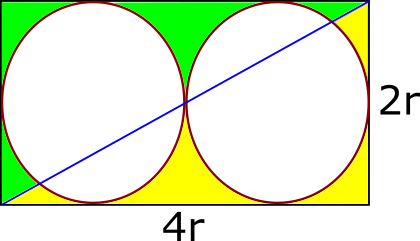
Find the total area of the parts shaded yellow in terms of r.

** (ii)** Find the total area of the parts shaded yellow in terms of r.

(Note that a small piece of area in yellow in the lower left corner is removed)

**(a)** The area shaded in yellow

**(b) (i)**

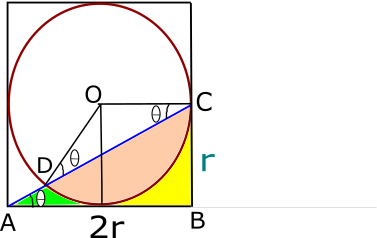


Total area shaded in yellow = total area shaded in green

Therefore, total area shaded in yellow

**(b)** **(ii)** We concentrate on the left square and find the lower left area that is removed.

(in green)



Area in green = area of ΔABC – area in yellow – area in orange

Area of ΔABC

Area in yellow

, then ,

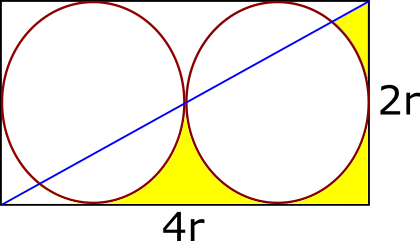
Also by Pythagoras Theorem, ,

Area of ΔDOC

Area of segment in orange = Area of sector – area of ΔDOC

Area in green = area of ΔABC – area in yellow – area in orange

Lastly, the total area of the parts shaded yellow

= area in part (a) - missing small piece of area in green calculated above

**Yue Kwok Choy**

**15/9/2016**