

### 3-Ring Circus

Let  $A$  be a circle with radius 3. Circles  $B$  and  $C$  with radii 1 and 2 respectively are internally tangent to circle  $A$ , and externally tangent to each other. Circle  $D$  is placed externally tangent to  $B$  and  $C$ , and internally tangent to  $A$ . The radius of circle  $D$  is a rational number. Find this radius.

