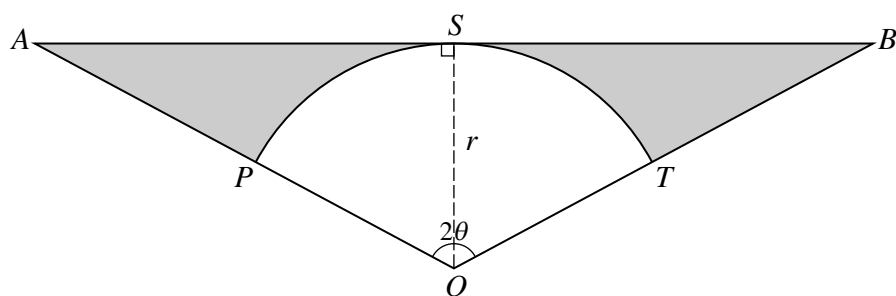


9



In the diagram, OAB is an isosceles triangle with $OA = OB$ and angle $AOB = 2\theta$ radians. Arc PST has centre O and radius r , and the line ASB is a tangent to the arc PST at S .

- (i) Find the total area of the shaded regions in terms of r and θ . [4]
- (ii) In the case where $\theta = \frac{1}{3}\pi$ and $r = 6$, find the total perimeter of the shaded regions, leaving your answer in terms of $\sqrt{3}$ and π . [5]