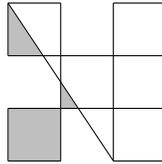
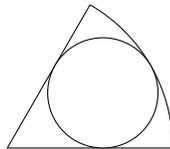


- Jonathan the Jangaroo hops north 5 miles, east 3 miles, and south 1 mile. Jonathan always hops in straight lines. How many miles is he from where he started?
- Daniel the Daterpillar has a kimchi pie with radius 6. He is starving so he cuts a 90 degree sector of his pie. What is the area of this slice of pie?
- A pentagon's interior angle measures form an increasing arithmetic sequence. The difference between the measures of the largest angle and smallest angle is 72. Find the measure of the largest angle in the pentagon.
- Find the area of the region bounded by the lines $y = x$, $y = 0$, $x = 10$, and $x = 20$.
- Find the area of the shaded region in the diagram below given that the 5 squares in the figure each have side length 12.



- $\triangle ABC$ has area 100. Points P, Q , and R are on sides AB, BC , and CA respectively such that PQ is parallel to AC and RQ is parallel to AB . If $\triangle PQR$ has area 64, then find the area of $APQR$.
- Jeffery the Jiraffe is really hungry. He cuts out a slice of pizza that is a 60 degree sector of a pizza with radius 3. He notices that a circular piece of pepperoni is perfectly inscribed in his pizza slice such that it is tangent to the two sides and crust of the pizza (neglect thickness of crust). Find the ratio of the area of the pepperoni to his pizza slice.



- Square $ABCD$ has side length 2. Let the midpoints of sides AB and CD be M and N . Segments DM and BN intersect the incircle of $ABCD$ at P and Q not equal to M and N . Find the area of quadrilateral $MPNQ$.
- $\triangle ABC$ has points D and E on AC such that $\angle ABD = \angle DBE = \angle EBC$ and $AD = 4$, $DE = 4$, and $EC = 8$. Find the perimeter of $\triangle ABC$.
- Isosceles $\triangle ABC$ has sides $AB = 7$, $AC = 7$, and $BC = 10$. Let the incircle of $\triangle ABC$ be circle O . A tangent to circle O is drawn so that it intersects sides \overline{AC} and \overline{BC} at points P and Q , respectively, such that $\triangle PQC$ is isosceles with $PQ = PC$. Compute the ratio between the area of $\triangle PQC$ and $\triangle ABC$.

