

Grade 9

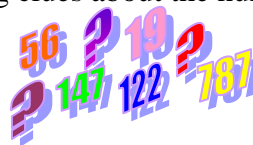
EXTRA CHALLENGES - SET IV

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1. Birkley has come up with a secret number. She gives the following clues about the number:

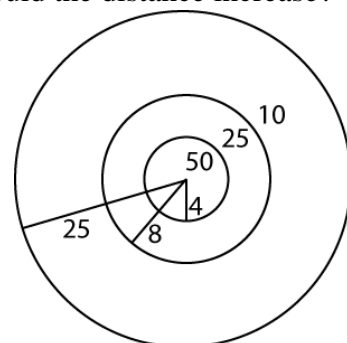
- ❖ It is a three-digit number
- ❖ When tripled, the units digit is 9
- ❖ The number is divisible by 9
- ❖ The first digit is the sum of the second and units digit

Find the secret number.



2. Edward jogs at a speed of 8 km/h. Arielle jogs at the same speed.
- a. If Edward jogs due west and Arielle jogs due north, how far apart will they be after 1.5 hours?
 - b. If Arielle jogs 2 km/h faster, by how much would the distance increase?

3. On a dart board the outer circle has radius 25, the middle circle has radius 8, and the inner circle has radius 4. The number of points earned for landing in each ring is shown in the diagram.



- a. What is the probability of getting exactly 25 points?
 - b. If you throw two darts, what is the probability of getting 60 points?
4. A cylindrical concrete pipe is 12.65 m long. It has an inside diameter of 48 cm and an outside diameter of 80 cm. Find, to the nearest cubic metre, the volume of concrete needed to make the pipe.
5. The volume of a sphere at time zero is $288\pi \text{ cm}^3$. The volume of a cone at time zero, whose height is always two times its radius, is $1152\pi \text{ cm}^3$. If the radius of the sphere is increasing at $\frac{1}{2} \text{ cm/sec}$ and the radius of the cone is decreasing at $\frac{1}{4} \text{ cm/sec}$, find the time, in seconds, when their radii are equal.

Formulas: $V_{\text{sphere}} = \frac{4}{3}\pi r^3$, $V_{\text{cone}} = \frac{1}{3}\pi r^2 h$ and $V_{\text{cylinder}} = \pi r^2 h$

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