

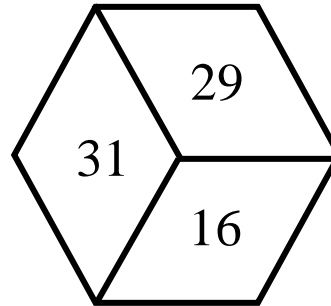
**Category 1
Mystery**

Meet #4 - February, 2014

Calculator Meet

50th anniversary edition

- 1) This cube has a number on each of its six faces. If the sum of the numbers on each pair of opposite faces is 78, then what is the sum of the three faces not shown?



- 2) The Shrewsbury Spocks soccer squad has won 17 games and lost 12 games. What is the least number of additional games that the Spocks must play so that they will have won 75% of all their games?
- 3) Mike takes 112 minutes to write 16 postcards. Sully writes four times as fast as Mike. How many postcards can Sully write in 14 hours?

ANSWERS

1) _____

2) _____

3) _____

Solutions to Category 6
Team Round
Meet #4 - February, 2013

<u>ANSWERS</u>	
1)	338 = A
2)	63 = B
3)	7168 = C
4)	150 = D
5)	24 = E
6)	18

1) Each angle adjacent to angle AOC measures 45 degrees, making the remaining acute angles also 45 degrees. If the diameter is 52, then the radius is 26. So, the total shaded area is $(2)(0.5)(26/\sqrt{2})(26/\sqrt{2}) = 338$

2) Let $X =$ the number of sand dollars
 So, $X + 60 =$ the number of periwinkles

$$\frac{X}{X+60} = \frac{3}{8} \quad \text{so} \quad 3(X+60) = 8X$$

$$3X + 180 = 8X$$

$$180 = 5X$$

$$36 = X$$

Let $F =$ the number of fiddler crabs

$$\frac{X}{F} = \frac{4}{7} \quad \text{so} \quad \frac{36}{F} = \frac{4}{7} \quad \text{and} \quad 4F = (7)(36)$$

$$\text{and} \quad 4F = 252 \quad \text{so} \quad F = 63.$$

3) Let $N =$ the common multiplier so that $7(N)(N)(N)(N) = 1792$, so $7N^4 = 1792 \dots N^4 = 256 \dots N = 4$. So, $1792(4) = E$ and $E = 7168$.

4) Let $X =$ the original price of any item, so the sale price = $X - (60\% \text{ of } X)$, or $0.4X$. Let $N =$ the factor by which the sale price is multiplied to attain the original price. Then $(N)(0.4X) = X$, and $N = X/(0.4X)$ so $N = 1/0.4$ or 2.5 . Therefore, the sale price must be multiplied by 250% to attain the original price, and so must be increased by 150% .

5) $715 / 37 = 19$ complete trips around Route 495, plus another 12 exits. Sheldon left the highway 12 exits beyond where he started, or $(2)(12)$ miles = 24 miles.

$$\begin{aligned} 6) \quad \sqrt{\sqrt{(D-\sqrt{B+1}+2)+A-E-2}} &= \sqrt{\sqrt{(150-\sqrt{63+1}+2)+338-24-2}} \\ \sqrt{\sqrt{(150-\sqrt{64}+2)+312}} &= \sqrt{\sqrt{(150-8+2)+312}} = \sqrt{\sqrt{144+312}} \\ &= \sqrt{12+312} = \sqrt{324} = 18. \end{aligned}$$