1.   At a class lunch, if each table has 4 chairs, there will
        be 3 students who cannot be seated. If each table
        has 5 chairs, there will be 2 empty chairs.
        What is the number of students at the class lunch?

                                                                    _____ 1

2.   A bucket was originally full of water. Every minute, 0.2 litres
        of water dripped out through a hole at the bottom.
        After 36 minutes, the bucket was only two-fifths full.
   How many litres of water were in the bucket when it was full?

                                                                    _____(litres) 2

3.   Six bowls are arranged in a row. Initially, there are 23 beans in
        Bowl A (on the left), 8 in B, 4 in C, 17 in D, 32 in E, and 6 in F.
        You want to move beans until there is an equal number of beans
        in each bowl. You are allowed to move a bean from any bowl to
        any other bowl. What is the minimum number of beans that have
        to be moved *in the left to right* direction?

        A   B   C   D   E   F
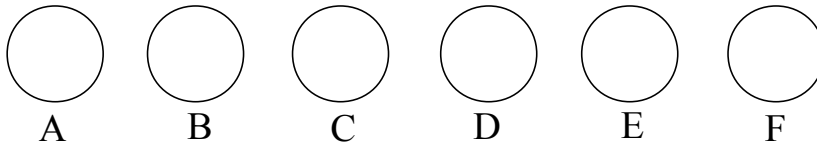
                                                                    _____ 3

4.   In the picture below, the larger square has side 5,
        and the smaller square has side 3.
        What fraction of the smaller square is shaded?
        Express your answer as a common fraction.
        (Hint: Some triangles are similar.)
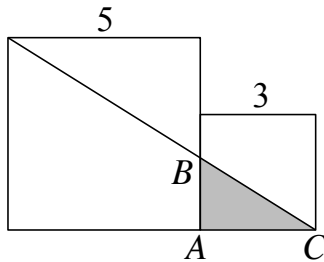
                                                                    _____ 4

Grade Seven (7) Division

5. Three-sevenths of the company's profit went into the pocket of the CEO.
    One-sixth of the rest was equally divided among the 20 senior executives.
    The balance was equally divided among the 10,000 workers.
    If each worker received $3.60, how many dollars did the CEO receive?

_____($) 5

6. Two crystal pyramids each have a 2×2 square base.
    The two bases are cemented together to make a new crystal.
    Let V be the number of vertices of this crystal, E the
    number of edges, and F the number of faces.
   What is the value of $V - E + F$?

_____ 6

7. There are 5 beads in a jar: 2 are white, and 3 are black.
    Jana picks 2 of the beads at random.
    What is the probability that the 2 beads are of the same colour?
    Express your answer as a common fraction.

_____ 7

8. A and B are the endpoints of a diameter of a circular pond, and
    C is a point on this diameter. It takes Andrew exactly as long to
    swim from C to A (along the diameter) as it takes for Joshua to
    run around the edge of the pool from B to A. It takes Andrew
    twice as long to swim from C to B (along the diameter) as it takes
    for Joshua to run around the edge of the pool from B to A.

    Given that Andrew swims at $\dfrac{6}{\pi}$ km/hour, at what

    speed (in km/hour) does Joshua run?
   (Hint: Find the location of C on AB.)
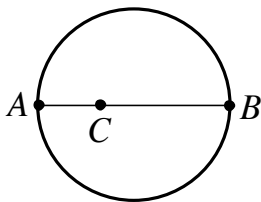
_____(km/h) 8

9.   ·Augustus writes a 5-letter word using the characters A, B, C, D,
       and E in a certain order from left to right.
       The letter A is to the left of C but to the right of D.
       The letter B is to the right of D but to the left of A.
       The letter E is to the right of B but to the left of C.
       If E is not the third letter of the word, which letter is third?

                                                                    _____ 9

10.   In the figure below, triangles ABC and ADC are isosceles
       ($CA = CB = CD$), and AB is parallel to CD.
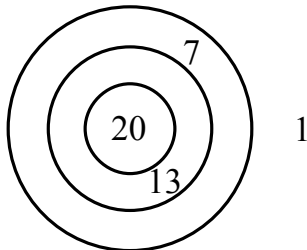   Given that $\angle CBA = 70°$, find the size (in degrees) of angle x.

       C ———————— D

       $x°$

       $70°$
       A B
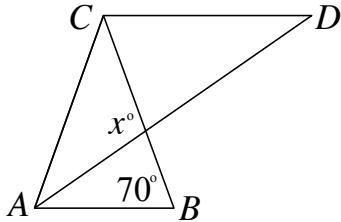
                                                          _____ (°) 10

11.   Bill wrote down the numbers 1, 2, 3, …,
       all the way to 2010 (inclusive).
       How many digits did he write altogether?

                                                                    _____ 11

12.   A circular dart board (the outer circle) has two additional circles drawn
       on it as shown. If a dart lands in a region, you get the number of points
       shown. Note that you get 1 point if the dart lands outside the dart board.
       In a game, Bully's score was 200, Avergy's score was 50, and Missy's
       score was 19. They each threw the *same* number of darts.
       What is the smallest possible value of that number
       of darts that each of them threw?
       (Hint: Most possibilities can be easily ruled out.)

       7

       20   1

       13

                                                                    _____ 12