

1. The average (mean) weight of five giant dates was 50g. Kate ate one and the average weight of the four remaining dates was 40 g. What was the weight of the date that Kate ate?

- (A) 10g      (B) 50g      (C) 60g      (D) 90g      (E) More information is needed

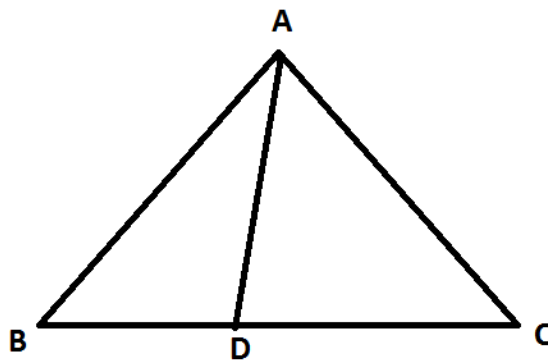
2. The ratio  $a:b=2:3$  and the ratio  $a:c=3:4$ . What is ratio  $b:c$ ?

- (A) 2:1      (B) 9:8      (C) 8:9      (D) 1:2      (E) 1:8

3. The pattern 123451234512345... is continued to form a 2012-digit number. What is the sum of all 2012 digits?

- (A) 75 033      (B) 60 033      (C) 30 033      (D) 7533      (E) 6 033

4. In the triangle  $ABC$ ,  $AD=BD=CD$ . What is the size of angle  $BAC$ ?



- (A)  $60^\circ$       (B)  $75^\circ$       (C)  $90^\circ$       (D)  $120^\circ$       (E) More information is needed

5. The number  $3^4 \times 4^5 \times 5^6$  is written out in full. How many zeros are there at the end of the number?

- (A) none      (B) 4      (C) 5      (D) 6      (E) More than 6

6.  $ABCDEFGHI$  is a regular nine-sided polygon (called a “nonagon” or “enneagon”). What is the size of angle  $FAE$ ?

- (A)  $10^\circ$       (B)  $20^\circ$       (C)  $30^\circ$       (D)  $40^\circ$       (E)  $50^\circ$

7. 120 students take an exam which is marked out of 100 (with no fractional marks). No three students are awarded the same mark. What is the smallest possible number of pairs of students who are awarded the same mark?

- (A) 9      (B) 10      (C) 19      (D) 20      (E) 60

8. The sum of seven consecutive odd numbers is 119. What is smallest of these numbers?

- (A) 11      (B) 13      (C) 15      (D) 17      (E) 19

9. If all the diagonals of regular hexagon are drawn, how many points of intersection are there, not counting the corners of the original hexagon?

- (A) 6      (B) 7      (C) 12      (D) 13      (E) 15

10. The area of a sector of a circle is 15% of the area of the whole circle. What is the angle of the sector at the centre of the circle?

- (A) 15      (B) 18      (C) 30      (D) 36      (E) 54

11. What is the last non-zero digit in the finite decimal representation of the number  $\frac{1}{5^{2012}}$ ?

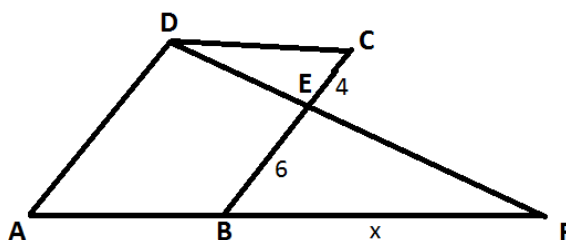
- (A) 2      (B) 4      (C) 6      (D) 8      (E) 5

12. What is the largest number of Sunday that there can be in any one year?

- (A) 50      (B) 51      (C) 52      (D) 53      (E) 54

13. ABCD is equilateral quadrilateral and DAF is a triangle with  $|CE| = 4$ ,  $|EB| = 6$ ,  $|BF| = x$ .

What is the length of  $x$  ?



- A) 10      (B) 12      (C) 14      (D) 9      (E) 15

14. The size of each exterior angle of a regular polygon is one quarter of the size of an interior angle. How many sides does the polygon have?

- (A) 10      (B) 9      (C) 8      (D) 11      (E) 12

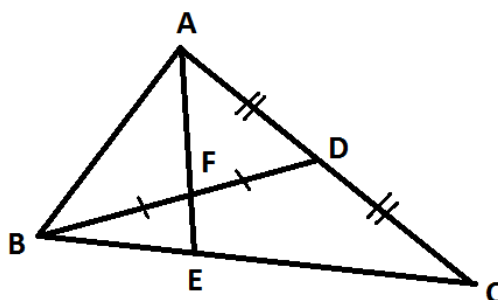
15. Two numbers differ by 9 and have sum 99. What is the ratio of the larger number to the smaller?

- (A) 5:4      (B) 6:5      (C) 7:6      (D) 8:7      (E) 9:8

16. The ratio of Jon's age to Jan's age is 3:1. Three years ago the ratio was 4:1. In how many years time will be the ratio 2:1?

- (A) 3      (B) 6      (C) 9      (D) 12      (E) 15

17. ABC is a triangle with  $|AD| = |DC|$  and  $|BF| = |FD|$ . Find  $|AF| / |FE|$  ?



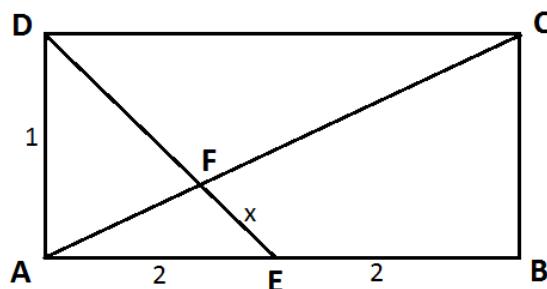
- (A)  $7/3$       (B)  $8/3$       (C)  $2$       (D)  $5/2$       (E)  $3$

18. Given that  $x$  is positive and less than 1, which of the following numbers is the largest?

- (A)  $x^2 + x$       (B)  $x^2$       (C)  $x^3$       (D)  $x^3 + x^2$       (E)  $x^4$

19. ABCD is a rectangular with  $|AD| = 1$ ,  $|AE| = |EB| = 2$ ,  $|EF| = x$ .

According to the given information find  $x$ ?



- (A)  $\frac{\sqrt{7}}{3}$       (B)  $\frac{\sqrt{5}}{3}$       (C)  $\frac{\sqrt{3}}{3}$       (D)  $\frac{\sqrt{5}}{2}$       (E)  $\frac{\sqrt{3}}{2}$

20. In how many different ways can seven different numbers be chosen from the numbers 1 to 9 inclusive so that the seven numbers have a total which is a multiple of 3?

- (A) Fewer than 10      (B) 10      (C) 11      (D) 12      (E) more than 12

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