Part A

1. The value of $\left(1+\frac{1}{2}\right)\left(1+\frac{1}{3}\right)\left(1+\frac{1}{4}\right)\left(1+\frac{1}{5}\right)$ is

   (A) $\frac{121}{120}$ (B) 3 (C) $\frac{207}{60}$ (D) $\frac{481}{120}$ (E) $\frac{21}{4}$

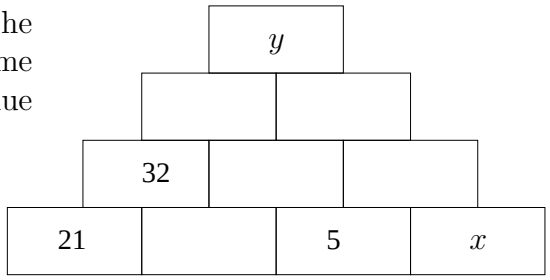
---

2. What is the remainder when 123 456 789 is divided by 11?

   (A) 1 (B) 3 (C) 5 (D) 7 (E) 10

---

3. The number in each block is the sum of the numbers in the two blocks beneath it. Some of the numbers are hidden. What is the value of $y - x$?



   (A) 21 (B) 48 (C) 58 (D) 69 (E) 85

---

4. A straight fence 144 m long is built by putting a post at each end, and a post every 6 m. How many posts are used building this fence?

   (A) 18 (B) 19 (C) 20 (D) 24 (E) 25

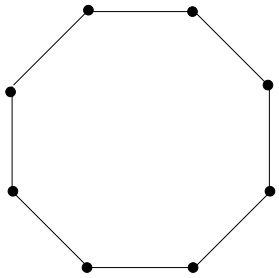
---

5. Today is my birthday. My age today, in months, is 14 times my age 4 years ago, in years. Today my age, in years, is

   (A) 8 (B) 12 (C) 14 (D) 21 (E) 28

---

6. In a polygon, a diagonal is a line segment joining two non adjacent vertices. For instance, there are two diagonals in a square. How many diagonals are there in the octagon showed here?



(A) 14 (B) 20 (C) 28 (D) 40 (E) None of these

---

7. A square is divided into two equal rectangles. Each of these rectangles has perimeter 27 cm. What is the area of the original square?

(A) 25 cm^2 (B) 49 cm^2 (C) 64 cm^2 (D) 81 cm^2 (E) 100 cm^2

---

8. A large windmill (for electricity generation) makes about 300 000 revolutions during a week when the wind blows constantly all the time. Which time, in seconds, is closest to the length of time for a single revolution?

(A) $\frac{1}{5}$ (B) $\frac{1}{2}$ (C) 1 (D) $\frac{3}{2}$ (E) 2

---

9. A hunter caught some animals : rabbits, birds and snakes. He counted 13 heads, 12 wings and 32 legs. How many snakes did he catch?

(A) 1 (B) 2 (C) 3 (D) 4 (E) 5

---

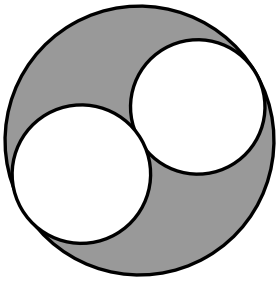
10. A box containing 5 oranges weighs 1.678 kilograms. The same box with 10 oranges in it weighs 2.278 kilograms. How much does the empty box weigh? (Assume all oranges weigh the same.)

(A) 0.300 kg (B) 0.539 kg (C) 0.600 kg (D) 1.078 kg (E) 1.356 kg

---

Part B

11.



The two smaller circles have equal diameters. What fraction of the larger circular region is shaded?

(A) $\frac{1}{6}$ (B) $\frac{1}{5}$ (C) $\frac{1}{4}$ (D) $\frac{1}{3}$ (E) $\frac{1}{2}$

---

12. A prime number is a positive integer greater than 1 divisible by only 1 and itself. How many prime numbers are between 100 and 110?

(A) 1 (B) 2 (C) 3 (D) 4 (E) 5

---

13. Grace read one quarter of a book on Monday. Tuesday she read one quarter of the remaining pages. Wednesday she read one quarter of the pages she had not yet read. Thursday she read the final 81 pages. How many pages are in the book?

(A) 192 (B) 243 (C) 256 (D) 324 (E) 446

---

14. In mathematics, $n!$ means the product of the numbers from 1 to n.
For example, $3! = 1 \times 2 \times 3$.

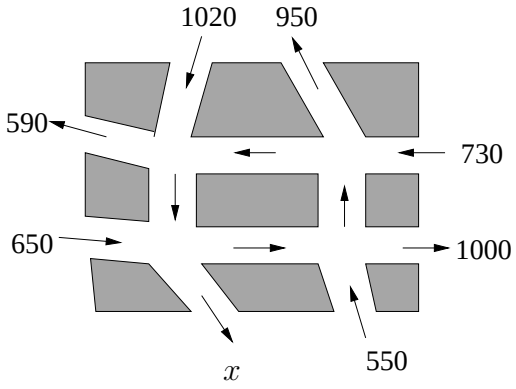
Determine the one's digit of the sum

$$1! + 2! + 3! + \cdots + 18! + 19! + 20!$$

(A) 0 (B) 3 (C) 5 (D) 7 (E) 9

15.

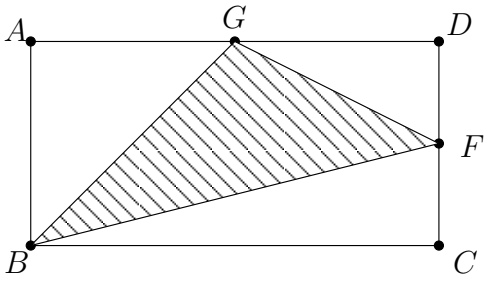
The diagram shows some streets in a New Brunswick town. All the streets are one way, with the direction as indicated by the arrows. At the beginning and end of the day there are no cars (parked or moving) on the streets. The numbers of cars that traveled along some of the streets during the day are indicated on the diagram. What is the value of x?



(A) 320 (B) 410 (C) 550 (D) 620 (E) Not enough information

16.

In the diagram, the area of rectangle $ABCD$ is 1. The point F is the midpoint of CD and G is the midpoint of AD. Find the area of triangle BFG.



(A) $\frac{3}{8}$ (B) $\frac{1}{2}$ (C) $\frac{5}{8}$ (D) $\frac{3}{4}$ (E) Not enough information

---

17. The volume of a liter is the same as that of a cube of side length 10 centimeters. A liter of water weighs 1 kilogram. A cubic centimeter of sand weighs 2 grams. How many liters of water weigh the same as a cube of sand with side length $\frac{1}{2}$ meter?

(A) 125 (B) 250 (C) 1 250 (D) 75 000 (E) 250 000

---

18. The average of four numbers is 24. If the largest number is left out, the average is 20. If the smallest is left out, the average is 30. What is the average of the middle two numbers?

(A) 25 (B) 26 (C) 27 (D) 28 (E) None of these

---

19. How many three digit numbers are such that the product of their digits is 120?

(A) 2 (B) 3 (C) 6 (D) 12 (E) 24

---

20. In a certain grade 9 class, there are 15 students in the choir and 12 in the drama club. The number of students who are in both the choir and drama club, is the same as the number of students who are in neither. How many students are in the class?

(A) 20 (B) 22 (C) 25 (D) 27 (E) Not enough information

Part C

---

21. Farmer Fred said to Farmer John: "If you sell me 45 hectares of land, I will have twice as much land as you." Then Farmer John said to Framer Fred: "If you sell me 45 hectares of land, I will have just as much land as you." How many hectares of land does farmer Fred have?

(A) 135 (B) 180 (C) 225 (D) 270 (E) 315

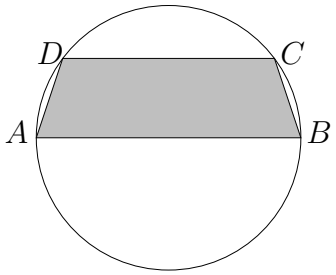
---

22. If $\dfrac{1}{x^3-2x-1} = -\dfrac{2}{3}$ then $\dfrac{1}{x^3-2x+1}$ equals

(A) $\dfrac{1}{2}$ (B) $\dfrac{2}{3}$ (C) $\dfrac{3}{2}$ (D) 2 (E) 3

23.

In the diagram, AB is a diameter of the circle and has length 10. DC is a chord of the circle parallel to AB with length 8. What is the area of the region $ABCD$?



(A) 24 (B) 27 (C) 30 (D) 33 (E) 36

---

24. The Peach Computer Company makes red computers and blue computers. The computers are identical, except for colour. Peach needs to ship computers to a customer.

    Peach fills the order by putting all of the red computers and $\frac{1}{6}$ of the blue computers into a box. The remaining blue computers are put into two more boxes. If the three boxes each contain exactly the same number of computers, what fraction of the computers are red?

    (A) $\frac{1}{6}$ (B) $\frac{1}{5}$ (C) $\frac{1}{4}$ (D) $\frac{1}{3}$ (E) $\frac{1}{2}$

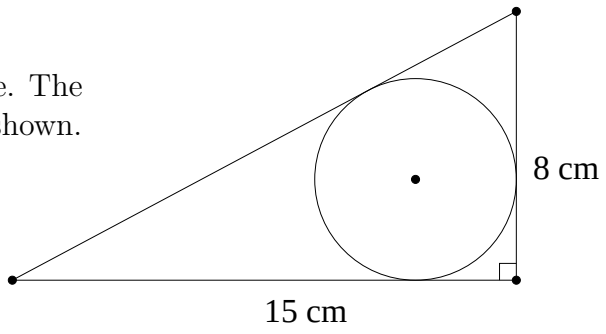
---

25. Two cars leave city A at the same time. The first car drives to city B at 60km/h, gets to city B, and then returns to city A at the same speed of 60km/h. The second car drives to city B at 90km/h and then returns to city A at some constant speed. The second car arrives back at city A at the same time as the first car. What was the speed of the second car during its return trip from city B to city A?

    (A) 25 km/h (B) 30 km/h (C) 35 km/h (D) 40 km/h (E) 45 km/h

---

26. A circle is inscribed in a right angle triangle. The legs of the triangle are 8 cm and 15 cm, as shown. What is the radius of the circle?



    (A) 3 cm (B) π cm (C) $2\sqrt{3}$ cm (D) $\sqrt{15}$ cm (E) 4 cm

---