
Part A

1. The value of $\frac{3}{1-\frac{1}{2}} - \frac{2}{1-\frac{1}{3}}$ is
- (A) -3 (B) 0 (C) 2 (D) 3 (E) 6
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2. The value closest to one million is:
- (A) 2^{10} (B) 2^{20} (C) 2^{30} (D) 2^{40} (E) 2^{50}
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3. Julie sells 3 ducks and 4 chickens for \$70.30. One chicken and one duck together are sold for \$20.70. What is the price of a chicken?
- (A) \$6.30 (B) \$8.20 (C) \$12.50 (D) \$14.10 (E) None of these
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4. Each hour, a wood-harvesting machine cuts the same number of logs and places them on a pile. At 8 am, there are 13 logs on the pile. At 11 am, the pile has grown to 46 logs. How many logs will the pile contain at 6 pm?
- (A) 66 (B) 77 (C) 86 (D) 112 (E) 123
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5. If $a = 2b$ and $b = 3c$ and $c = 4d$, then $a + b + c$ equals
- (A) $9d$ (B) $12d$ (C) $20d$ (D) $24d$ (E) $40d$
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6. An automobile dealer sells 2 models of cars, A and B. Model A can be purchased in 7 different colours and 4 different engine sizes. Model B comes in 8 colours and 3 engine sizes. How many cars must the dealer order to have one car of each model in each colour and engine size?
- (A) 22 (B) 42 (C) 52 (D) 105 (E) 672
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7. Paul bought some candies and gave the storekeeper \$1. He received 4 coins in change. The cost of the candies could **not** be
- (A) 20¢ (B) 40¢ (C) 69¢ (D) 80¢ (E) All of these are possible
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8. If $\frac{1}{2 + \frac{1}{3x}} = \frac{1}{10}$, then x must have the value

- (A) $\frac{1}{24}$ (B) $\frac{3}{8}$ (C) $\frac{8}{3}$ (D) 24 (E) None of these
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9. The operation # is defined as $a \# b = 3b - 2a$. The value of $(5 \# 4) \# 3$ is

- (A) -5 (B) 0 (C) 2 (D) 5 (E) 15
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10. A ferryboat operator charges a fee for crossing a river. You have the choice between paying a fare of \$2 per trip or to pay \$10 for a pass that allows you to receive a 25% discount from the regular price for each crossing. What is the least number of times that you must cross the river so that you would pay less by buying the pass than by paying the full fare each time you cross?

- (A) 10 (B) 19 (C) 20 (D) 21 (E) 25
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Part B

11. What is the next number in the sequence: 0, 1, 1, 2, 4, 7, 13, 24, ...?

- (A) 30 (B) 37 (C) 41 (D) 44 (E) 48
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12. The cost of visiting a zoo is \$5 for an adult and \$3 for a child. By the end of the day, 630 persons had visited the zoo and the revenue for the day was \$2368. How many children visited the zoo on that day?

- (A) 230 (B) 238 (C) 239 (D) 240 (E) None of these
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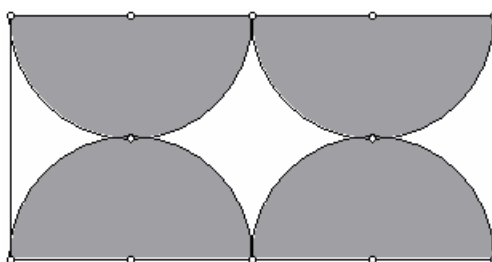
13. You begin a new job in which you make children's toys. Because you improve as you learn how to do your work, each day you can make 2 more toys than the previous day. If you started work on Monday and you made 45 toys during the 5-day work week, how many toys did you make on Thursday?

- (A) 5 (B) 6 (C) 7 (D) 9 (E) 11
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14. A reservoir has 3 sources of water. Source A can fill the reservoir in 2 days, source B in 3 days and source C in 6 days. How long would it take to fill the reservoir using all 3 sources?

- (A) $\frac{1}{2}$ day (B) 1 day (C) 2 days (D) $\frac{5}{2}$ days (E) None of these
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15. Four half circles of radius r are traced inside a rectangle. What is the area of the white region?

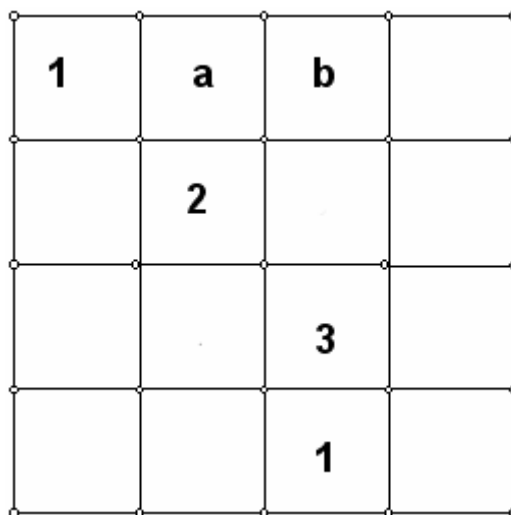


- (A) $(8 - 2\pi) r^2$ (B) πr^2 (C) $4 r^2$ (D) $2\pi r^2$ (E) $8 r^2$
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16. The positive integers, starting with 1, are written in order 123456789101112.... The digit appearing in the 100th place is

- (A) 0 (B) 4 (C) 5 (D) 6 (E) 7
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17. In the following 4x4 diagram, each row, each column and each diagonal contains each of the numbers 1, 2, 3 and 4. What is the value of $a + b$?



- (A) 3 (B) 4 (C) 5 (D) 6 (E) 7
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18. When writing all of the integers from 1 to 100, the digit 3 is used 20 times. How many times will the digit 3 be used in writing the numbers from 1 to 1000?

- (A) 200 (B) 210 (C) 290 (D) 300 (E) None of these
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19. How much 1% fat milk should we mix with 15% fat cream to obtain 5 litres of 3% fat mixture?

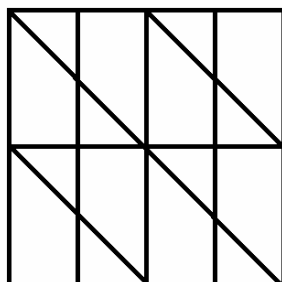
- (A) $\frac{5}{7}$ l. (B) 1 l. (C) 3 l. (D) 4 l. (E) $\frac{30}{7}$ l.
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20. In a school, all of the students study physics or chemistry. Sixty percent of the students who study physics also study chemistry, but only one third of the chemistry students study physics. If there are 110 students in this school, how many of them study both of these subjects?

- (A) 22 (B) 30 (C) 50 (D) 60 (E) None of these
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Part C

21. How many triangles can be found in the figure shown below?



- (A) 12 (B) 14 (C) 16 (D) 18 (E) 20
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22. A cube composed of 216 $1 \times 1 \times 1$ cubes is painted and then broken apart again into the smaller cubes. How many of the $1 \times 1 \times 1$ cubes will have exactly 2 painted faces?

- (A) 24 (B) 36 (C) 48 (D) 56 (E) 60
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23. The length, L , of a rectangle is increased by 50% and the width, W , is doubled to form a larger rectangle with an area of 30 cm^2 . What is the largest possible perimeter of the larger rectangle if L and W are integers with $L > W$?

- (A) 22 cm (B) 23 cm (C) 26 cm (D) 34 cm (E) 43 cm
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24. What are the last two digits of the number 32^{2006} ?

- (A) 24 (B) 32 (C) 68 (D) 76 (E) None of these
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25. The digits 1, 2, 3, 4, 5 and 6 can be arranged to form 720 different numbers. How many of these numbers will have the digits 1, 2 and 3 in that order? For example, 614235 and 165243 are two such numbers.

- (A) 6 (B) 120 (C) 240 (D) 360 (E) None of these
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26. A door has an opening code consisting of 5 distinct digits. The last digit is either 3, 6 or 7. The sum of the first two digits is 13 while the sum of the first and last digit is 9. The fourth digit is odd. If the sum of all 5 digits is 21 and none of them is zero, what is the sum of the second and third digits in the code?

(A) 7

(B) 9

(C) 11

(D) 12

(E) 13
