

DIAGNÓSTICO DE MATEMÁTICA PARA INICIANTE

Não utilize calculadora nem rascunho.
Faça tudo o que precisar fazer neste papel.
Informe o tempo utilizado na resolução.

NOME: _____ TEL: _____

FORMAÇÃO ACADÊMICA: _____ INSTITUIÇÃO: _____

TEMPO UTILIZADO NA RESOLUÇÃO: _____

1. Macey is four times as old as Mike. In 8 years, she will be three times as old as Mike. How old was Macey 3 years ago?

- (A) 16
- (B) 29
- (C) 32
- (D) 61
- (E) 64

2. a) List all of the factors of 36: _____

b) Write 4 multiples of 19: _____

3.
$$\begin{pmatrix} \frac{5}{6} + \frac{1}{2} \\ \frac{3}{2} - \frac{1}{3} \end{pmatrix} \times \begin{pmatrix} \frac{4 \times 1}{3} - \frac{1}{4} \\ \frac{2}{3} + \frac{8}{2} \end{pmatrix} =$$

4. Bob's average score on five tests was 85. If he received scores of 90, 80, 78, and 82 on four of the five tests, what was his score on the remaining test?

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5. A jar contains black and white marbles in the ratio 2:3. If the jar contains a total of 30 marbles. How many of the marbles are black?
6. Factor the expressions: a) $ab + cd + ac + bd$: _____
b) $a^2 - b^2$: _____
c) $x^2 - yx + 2x$: _____
7. If the 9 marbles were added to a jar of marbles, the number of marbles would be greater than 3 times the original number of marbles. What is the greatest possible number of marbles that were in the jar originally?
- (A) 2
(B) 3
(C) 4
(D) 5
(E) 6
8. If a circle graph, draw to scale, shows the total annual budget for a company that has five departments, what is the measure of the central angle of the sector representing the department that has an annual budget equal to $\frac{5}{18}$ of the company's total annual budget?
- (A) 20°
(B) 50°
(C) 72°
(D) 100°
(E) 110°
9. A total of \$20,000 was invested in two certificates of deposit at simple annual interest rates of 6% and 8%, respectively. If the total interest on the two certificates was \$1,440 at the end of one year, what fractional part of the \$20,000 was invested at the higher rate?
- (A) $\frac{3}{8}$
(B) $\frac{2}{5}$
(C) $\frac{1}{2}$
(D) $\frac{3}{5}$
(E) $\frac{3}{4}$

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10. If $3x + 2y = 7$ and $2x - y = 7$, what is the value of x ?

- (A) 0
- (B) 1
- (C) $7/5$
- (D) $21/11$
- (E) 3

11. If $y = x^2 - 5x + 14$ and $z = x^2 - x + 2$, what is the set of all values of x for which $y = 2z$?

- (A) $\{-5\}$
- (B) $\{2\}$
- (C) $\{3\}$
- (D) $\{-2, 5\}$
- (E) $\{-5, 2\}$

12. $(1 + \sqrt{5})(1 - \sqrt{5}) =$

- (A) -4
- (B) 2
- (C) 6
- (D) $-4 - 2\sqrt{5}$
- (E) $6 - 2\sqrt{5}$

13. Which of the following inequalities is equivalent to $3x - 10 > x + 10$?

- (A) $x > -10$
- (B) $x > 0$
- (C) $x > 5$
- (D) $x > 10$
- (E) $x > 20$

14. If $|x - 2| > 0$ then it must be true that:

- (A) $x < 0$
- (B) $x = 0$
- (C) $x \neq 2$
- (D) $x > -2$
- (E) $x > 2$

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15. Which of the following is the set of all integers y for which $6x^2 + 9y + 17$ is an even integer?
- (A) The integers
 - (B) The nonzero integers
 - (C) The nonzero, even integers
 - (D) The even integers
 - (E) The odd integers
16. If $x^2 < x$, then x must be
- (A) less than 0
 - (B) equal to 0
 - (C) between 0 and 1
 - (D) equal to 1
 - (E) greater than 1
17. A computer programmer needs to print 148 documents. The documents have an average (arithmetic mean) length of 10 pages and the printer takes 15 seconds to print each page. Approximately how many hours will it take to print all the documents if they are printed without interruptions?
- (A) $\frac{1}{2}$ h
 - (B) $\frac{1}{3}$ h
 - (C) 2.5 h
 - (D) 6 h
 - (E) 24 h
18. Machine A working alone can complete a job in $3\frac{1}{2}$ hours. Machine B working alone can do the same job in $4\frac{2}{3}$ hours. How long will it take both machines working together at their respective constant rates to complete the job?
- (A) 1 h 10 min
 - (B) 2 h
 - (C) 4 h 5 min
 - (D) 7 h
 - (E) 8 h 10 min

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19. A retailer sold an appliance for 30 percent above cost, which represented a gross profit of \$21.00. For what price did the retailer sell the appliance?
- (A) \$27.30
 - (B) \$51.00
 - (C) \$63.00
 - (D) \$70.00
 - (E) \$91.00
20. During a two-week period. The price of an ounce of silver increased by 25 percent by the end of the first week and then decreased by 20 percent of this new price by the end of the second week. If the price of silver was x dollars per ounce at the beginning of the two-week period, what was the price, in dollars per ounce, by the end of the period?
- (A) $0.8x$
 - (B) $0.95x$
 - (C) x
 - (D) $1.05x$
 - (E) $1.25x$
21. A \$500 investment and a \$1.500 investment have a combined yearly return of 8.5 percent of the total of the two investment. If the \$500 investment has a yearly return of 7 percent, what percent yearly return does the \$1.500 investment have?
- (A) 9%
 - (B) 10%
 - (C) 10.625 %
 - (D) 11%
 - (E) 12%
22. At a certain school, 45 percent of the students were taking science and 50 percent of the students were taking history. If 35 percent of the students were taking both science and history, what percent of the students were taking science or history or both?
- (A) 95%
 - (B) 85%
 - (C) 80%
 - (D) 60%
 - (E) 25%

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23. Thirty percent of the members of a swim club have passed the lifesaving test. Among the members who have not passed the test, 12 have taken the preparatory course and 30 have not taken the course. How many members are there in the swim club?

- (A) 60
- (B) 80
- (C) 100
- (D) 120
- (E) 140

24. If $2^x = a$ e $2^y = b$, then 2^{-3x+y} is:

- (A) a^3b
- (B) a^3b^{-1}
- (C) $a^{-3}b^{-1}$
- (D) $a^{-3}b$
- (E) $\sqrt{a^{-3}b}$

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