

Test Four: Math, No Calculator
Additional Problems

Once you have read through the test marked Test Four: Math, No Calculator and understand the solutions, complete the following practice test to reinforce what you have just learned. Good luck!

Question 1

Which of the following expressions is equal to 0 for some value of a ?

- A) $|a - 2| - 2$
- B) $|a + 2| + 2$
- C) $|2 - a| + 2$
- D) $|a - 2| + 2$

Question 2

$$f(x) = 4x + y$$

In the function above, y is a constant. If $f(2) = 11$, what is the value of $f(-3)$?

- A) -9
- B) -3
- C) 9
- D) -12

Question 3

$$3(y + 3)$$

$$\frac{y}{x} = 2$$

If (x,y) is the solution to the system of equations above, what is the value of y ?

- A) 5
- B) 2
- C) 3
- D) 6

Question 4

If $f(x) = -3x^2 + x - 4$, what is $f(2x)$ equal to?

- A) $12x + 2x - 4$
- B) $12x^2 - 2x - 4$
- C) $-12x^2 - 2x - 4$
- D) $-12x^2 + 2x - 4$

Question 5

$$6(x+3)(3x-9)$$

Which of the following is equivalent to the expression above?

- A) $24x + 72$
- B) $18x^2 + 162$
- C) $3x^2 - 27$
- D) $18x^2 - 27$

Question 6

If $\frac{x^2-y}{x} = \frac{4}{3}$, which of the following must also be true?

A) $\frac{x^2-y}{x} = \frac{3}{4}$

B) $\frac{x}{y} = \frac{4}{3}$

C) $\frac{x}{y} = \frac{-3}{5}$

D) $\frac{y}{x} = \frac{5}{3}$

Question 7

While learning to type, Joe created a training schedule in which the amount of words he types per minute (WPM) each week increased by a certain amount. If John's training schedule requires that his fastest WPM in week 3 is 70 and his fastest WPM in week 9 is 100, which of the following best describes how the words per minute John types changes between week 3 and week 9 of his training schedule

- A) John increases his fastest WPM by 5 words each week.
- B) John increases his fastest WPM by 30 words each week.
- C) John increases his fastest WPM by 30 words every 9 weeks.
- D) John increases his fastest WPM by 10 words each week.

Written by Nicole D'Onofrio

Question 8

Which of the following equations represents a line that is parallel to the line in the equation $y = 2x + 10$?

A) $y = 10x + 2$

B) $\frac{y}{2} = x + 10$

C) $y = x + 10$

D) $\frac{y}{2} - 5 = x$

Written by Nicole D'Onofrio

Question 9

If $b = -19$, what is the solution set of the equation above?

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

Question 10

If $\frac{a+3}{a-3} = 2$, what is the value of a ?

- A) 7
- B) 9
- C) $\frac{3}{2}$
- D) 2

Question 11

$$\begin{aligned}x &= 2y + 3 \\ y &= (3x - 7)(2x - 5)\end{aligned}$$

How many ordered pairs (x, y) satisfy the system of equations shown above?

- A) 0
- B) 1
- C) 2
- D) Infinitely many

Written by Jieyi (Crystal) Ding

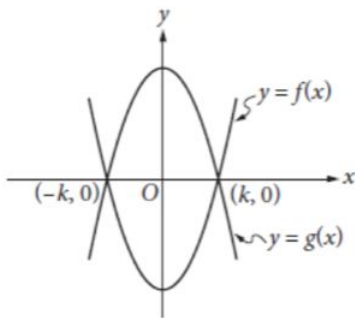
Question 12

Nicole and Tracy each order a beverage at a cafe. The price of Nicole's beverage is P dollars, and the price of Tracy's beverage is 2 dollars more than 3 times the price of Nicole's beverage. If Nicole and Tracy split the cost of the beverages evenly and each paid a 15% tip, which of the following expressions represents the amount, in dollars, each of them paid? (Assume there is no sales tax.)

- A) $2.30P + 2.30$
- B) $4P + 2$
- C) $4P + 1.15$
- D) $2.30P + 1.15$

Written by Nicole D'Onofrio

Question 13



The functions f and g , defined by $f(x) = -12x^2 + 3$ and $g(x) = 12x^2 - 3$, are graphed in the xy -plane above. The graphs of f and g intersect at the points $(k, 0)$ and $(-k, 0)$. What is the value of k ?

- A) 1
- B) -1
- C) $1/8$
- D) $1/2$

Question 14

$$\frac{10+8i}{5i-4}$$

If the expression above is rewritten in the form $a + bi$, where a and b are real numbers, what is the value of b ? (Note: $i = \sqrt{-1}$)

- A) $\frac{8}{5}$
- B) 1
- C) -2
- D) $-\frac{9}{5}$

Written by Jieyi Crystal Ding

Question 15

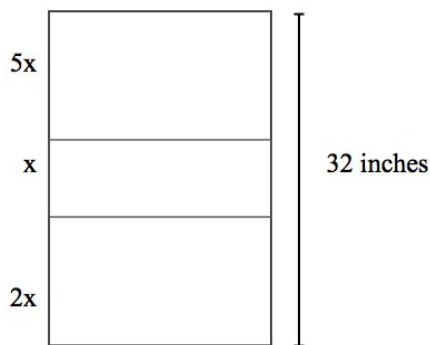
$$2x^2 - \frac{k}{2}x = -2p$$

In the quadratic equation above, k and p are constants. What are the solutions for x ?

- A) $x = \frac{k}{8} \pm \frac{\sqrt{k^2+32p}}{4}$
- B) $x = \frac{k}{4} \pm \frac{\sqrt{k^2+64p}}{8}$
- C) $x = \frac{k}{4} \pm \frac{\sqrt{k^2-32p}}{4}$
- D) $x = \frac{k}{8} \pm \frac{\sqrt{k^2-64p}}{8}$

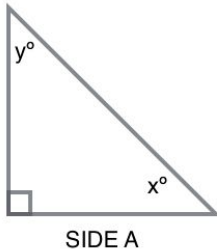
Written by Jieyi (Crystal) Ding

Question 16



Nicole has a rectangle shelf system in her dorm that fits in her closet. The total height of the system is 32 inches, and there are three parallel shelves that make up the system shown above. What is the maximum height for an item placed on the bottom shelf?

Written by Nicole D'Onofrio

Question 17

In the triangle above, the cosine of y° is .4. What is the sine of y° , if side A equals .2 ?

Written by Nicole D'Onofrio

Question 18

$$x^3 - 3x^2 + 10x - 30 = 0$$

For what real value of x is the equation above true?

Question 19

$$\begin{aligned} -2x + 5y &= 14 \\ 5x - 4y &= -1 \end{aligned}$$

If (x, y) is the solution to the system of equations above, what is the value of x ?

Written by Jieyi (Crystal) Ding

Question 20

The distance between Town A and Town C is 55 kilometers. A motorist is at Town A and has 15 gallons of gas left. The motorist drives from Town A to Town C and makes a stop inbetween at Town B, 30 kilometers from Town A. He has used up 10 gallons of gas so far. For every 5 gallons, how many kilometers can the motorist travel?

Written by Faizan Dogar

Great work! Click on the "Additional Problems Key" to score your test. Then redo the problems that you scored incorrectly.