WEEK3.8

Math

22 QUESTIONS
(TIME: 35 MIN)

DIRECTIONS

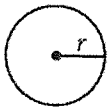
The questions in this section address a number of important math skills.
Use of a calculator is permitted for all questions.

NOTES

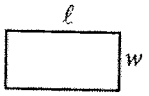
Unless otherwise indicated:

- All variables and expressions represent real numbers.
- Figures provided are drawn to scale.
- All figures lie in a plane.
- The domain of a given function f is the set of all real numbers x for which $f(x)$ is a real number.

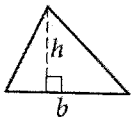
REFERENCE



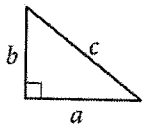
$A = \pi r^2$
$C = 2\pi r$



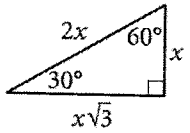
$A = \ell w$

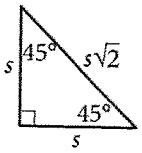


$A = \frac{1}{2}bh$

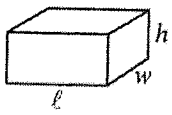


$c^2 = a^2 + b^2$

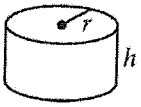




Special Right Triangles

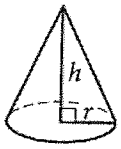


$V = \ell wh$

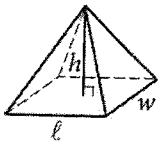


$V = \pi r^2 h$

$V = \frac{4}{3}\pi r^3$



$V = \frac{1}{3}\pi r^2 h$



$V = \frac{1}{3}\ell wh$

The number of degrees of arc in a circle is 360.

The number of radians of arc in a circle is 2π.

The sum of the measures in degrees of the angles of a triangle is 180.

CONTINUE

For multiple-choice questions, solve each problem, choose the correct answer from the choices provided, and then circle your answer in this book. Circle only one answer for each question. If you change your mind, completely erase the circle. You will not get credit for questions with more than one answer circled, or for questions with no answers circled.

For student-produced response questions, solve each problem and write your answer next to or under the question in the test book as described below.

- Once you've written your answer, circle it clearly. You will not receive credit for anything written outside the circle, or for any questions with more than one circled answer.
- If you find **more than one correct answer**, write and circle only one answer.
- Your answer can be up to 5 characters for a **positive** answer and up to 6 characters (including the negative sign) for a **negative** answer, but no more.
- If your answer is a **fraction** that is too long (over 5 characters for positive, 6 characters for negative), write the decimal equivalent.
- If your answer is a **decimal** that is too long (over 5 characters for positive, 6 characters for negative), truncate it or round at the fourth digit.
- If your answer is a **mixed number** (such as $3\frac{1}{2}$), write it as an improper fraction (7/2) or its decimal equivalent (3.5).
- Don't include **symbols** such as a percent sign, comma, or dollar sign in your circled answer.

$$\sqrt{4(x-m)} = x - m$$

In the given equation above, where m is a positive constant. The greatest solution is 6. What is the value of m?

2

A computer processes at a constant rate of 82 data per second. At what rate, in data per minutes, does the computer processes the data?

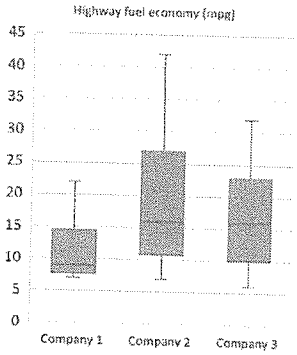
3

$$x - 2y = -1$$
$$-3 + 3x = 4y - 2$$

The solution to the system of equations above is (x, y). What is the value of $2x$?

A) 2
B) 3
C) 4
D) 6

4



Customer Reports released highway fuel economy data (mpg) of three companies for 10 years (2011-2021). Which company shows the largest **range** of highway fuel economy from the boxplot above?

A) Company 1
B) Company 2
C) Company 3
D) All companies have the same range

5

ANNUAL PERCENT CHANGE IN SALES AT TIRE STORES FROM 2020 TO 2022

STORE	Percent change 2020-2021	Percent change 2021-2022
A	20	-20
B	-10	10
C	15	-15

If the sales in dollar at Store B was $12,000 for 2020, what was the dollar amount of sales at the store for 2022?

A) $12,000
B) $11,880
C) $11,730
D) $11,520

6

$$y + mx = 3$$
$$y = x^2 - 2m$$

In the system of equations above, If the equations are graphed in the XY-plane, their graphs intersect at two points assuming m is a constant. Which of the following **cannot** be the value of m?

A) 0
B) -1
C) -3
D) -7

7

PETER'S MATH SCORE REPORT

	Percent of grade	Cumulative Scores
Homework	10	90
Attendance	10	100
Tests / Quizzes	60	87
Final Test	20	

The table above shows the distribution of the cumulative scores of each portion of Peter's Math Grade before his final test. If grade A is required to get the cumulative combined scores greater than or equal to 90 in his math class, what is the **lowest score** he need to get for the final test in order to achieve grade A?

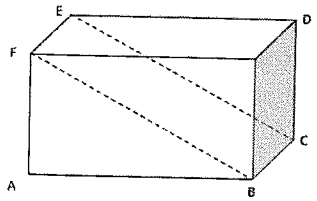
A) 96
B) 95
C) 94
D) 93

8

Which of the following expressions is equivalent to $8x^3y^4 - 32x^7y^2$?

A) $8x^7y^4(y^3 - x^2)$
B) $-8x^3y^4(-1 + 4x^4y^4)$
C) $8x^3y^2(y - 2x^2)(y + 2x^2)$
D) $8x^3y^2(y^2 - 4x^2)$

9



In the rectangular solid above, If AB = 4, BC = 5, and CD = 3, What is the area of rectangular region BCEF?

A) 20
B) 25
C) $4\sqrt{34}$
D) $3\sqrt{41}$

10

If the difference of two angles U and N is $\frac{5\pi}{36}$ radians $(U > N)$ and the measure of angle is U is $\frac{\pi}{3}$ radians, what is the measure of angle N, in degrees?

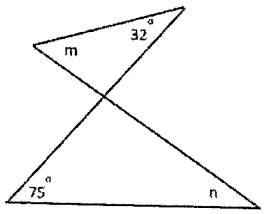
A) 20
B) 25
C) 30
D) 35

11

$$f(x) = -2x^2 + 4x + m$$

In the function above, if m is a unknown constant, for what value of x does the function have the same value of $f(-2)$?

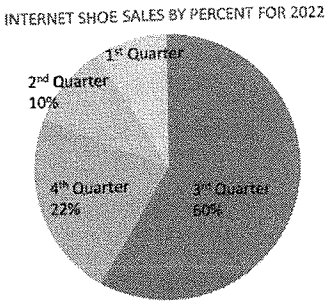
12



In the figure above, what is the value of $m - n$?

A) -33
B) -43
C) 33
D) 43

13



The circle graph above shows the distribution of Shoe sales for ABC shop in 2022. What is the nearest degree of the central angle for 1st Quarter sales?

14

$$5f + 6s + 12j = 1{,}230$$

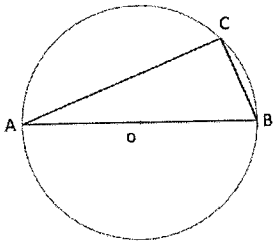
A school consists of 5 freshmen classes, 6 sophomore classes, and 12 junior classes. The total number of students who has a social media account is 1,230. The equation above represents the situation. What is the best interpretation of **s** in the context?

A) The total number of sophomore students in the school
B) The total number of sophomore students who has social media account in the school
C) The average number of sophomore students who has social media account in the school
D) The average number of students who has social media account in the school

15

List A and list B contain 50 numbers and 60 numbers respectively. If the mean of list A is 25 and the mean of list B is 34, what is the positive difference in their sums?

16



If the diameter ($\overline{AB}$) of the circle O above is 10 and BC = 6, what is the area of triangle ABC?

A) 24
B) 28
C) 30
D) 32

CONTINUE

17

$$\frac{x(xy^2)^4}{x^4y^3} = x^m y^n$$

In the equation above, If $xy \neq 0$, what is the value of $m + n$?

18

The function f has the property for all x that

$$2f(x) = f(2x)$$

If $f(2) = 4$, what is the value of $f(1)$?

19

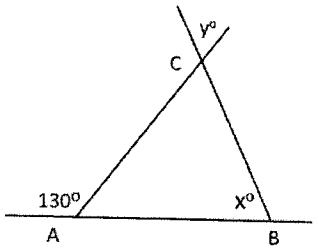
$$\frac{1}{2}k - y = \frac{7}{2}$$

$$-2x + 4y = -14$$

In the system of equations above, for a real number k, which of the following points lies on the graph of each equation?

A) $\left(k, \frac{k}{2} + \frac{7}{2}\right)$
B) $(2k + 7, k)$
C) $(k, 7 + 2k)$
D) $(2k - 7, k)$

20



Note: not drawn to scale

In the figure above, assuming AB = BC, what is the value of $x + y$?

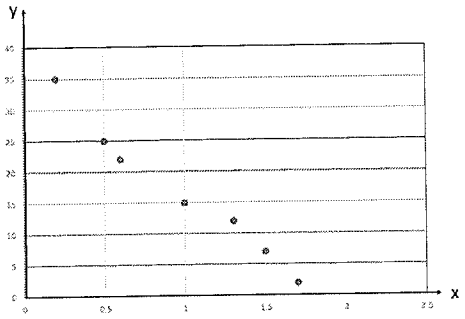
21

$$2x^2 + 4x + 2y^2 - 8y = -4$$

In the circle equation above, what is the area of the circle?

A) π
B) 3π
C) 6π
D) $\sqrt{6}\pi$

22



Which of the following equations is the most accurate linear model for the scatterplot shown above?

A) $y = 21.6x + 35$
B) $y = 21.6x - 35$
C) $y = -21.6x + 35$
D) $y = -21.6x - 35$

STOP

If you finish before time is called, you may check your work on this module only. Do not turn to any other module in the test.

CONTINUE