# Math

**22 QUESTIONS**
**(TIME: 35 MIN)**

**DIRECTIONS**

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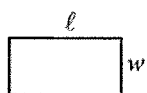Use of a calculator is permitted for all questions.

**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.
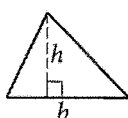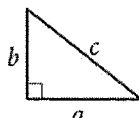
**REFERENCE**
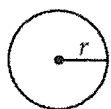


$A = \pi r^2$
$C = 2\pi r$
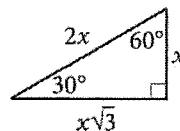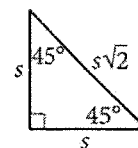
$A = \ell w$

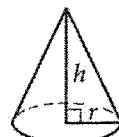$A = \frac{1}{2} bh$

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

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 $2\pi$.

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

**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.

**1**
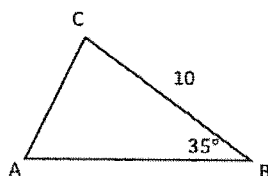


Triangle ABC is similar to another triangle FGH (not shown). If $\angle A$ and $\angle C$ correspond to $\angle F$ and $\angle H$, respectively and $AC = \frac{1}{2}FH$, Which of the following must be true?

I.   The perimeter of $\triangle ABC$ is $\frac{1}{2}$ the perimeter of $\triangle FGH$
II.  $m\angle G = 35°$
III. The length of FG is 20

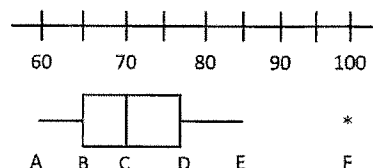A) I only
B) I and II only
C) II only
D) I, II, and III

**2**

A quadratic function is graphed in the XY-plane. Which of the following forms shows where the graph intersects y-axis in the equation?

A)  $y = a(x - h)^2 + k$
B)  $y = a(x - b)(x - c)$
C)  $y - k = a(x^2 + bx)$
D)  $y = ax^2 + bx + c$

**3**

TEMPERATURE DISTRIBUTION IN A YEAR



In the boxplot above, one of the data (F) is far away from the rest of data, called "outlier". If the outlier is removed from the data, which of the following would change from least to greatest?

I.   Mean
II.  Median
III. Range

A)  $II < I < III$
B)  $I < II < III$
C)  $III < I < II$
D)  $II < III < I$

**4**

If a line is parallel to $y = -\frac{1}{2}x - 5$ and has a x-intercept at (4,0) in the XY-plane, what is the equation of the line?
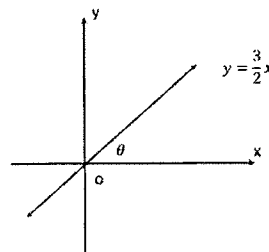
E)  $y = 2x - 8$
F)  $y = 2x - 5$
G)  $y = -\frac{1}{2}x + 2$
H)  $y = -\frac{1}{2}x + 4$

5

$$2x - 5kx = 26$$

In the equation above, k is a constant. If the equation has no solution, what is the value of k?

6

A spinner is divided into 15 equal parts and numbered 1 through 15. What is the probability of spinning a number less than 6 or greater than 10 in a single spin?

A) $\dfrac{1}{3}$

B) $\dfrac{2}{3}$

C) $\dfrac{11}{15}$

D) $\dfrac{12}{15}$

7



In the graph above, A line $y = \dfrac{3}{2}x$ forms an angle $\theta$ between the line and positive x-axis in the XY-plane. What is the value of $\sin\theta$?

A) $\dfrac{\sqrt{13}}{2}$

B) $\dfrac{\sqrt{13}}{3}$

C) $\dfrac{3}{2}$

D) $\dfrac{3}{\sqrt{13}}$

8

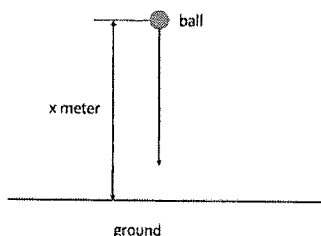Two of three sides of a triangle are 10 and 5. Which of the following numbers cannot be a perimeter of the triangle?

A) 21

B) 25

C) 27

D) 30

CONTINUE

### 9

Two years ago, Amelie was twice as old as peter. 6 years ago, Amelie was four time as old as peter. What is the value of sum of their current ages?

A)  20
B)  21
C)  22
D)  24

### 10

ball

x meter

ground

When a ball released x meter (initial height) above the ground as shown in the figure, the maximum height, in meter, the ball can reach after bouncing once could represent in the following equation.

$$y = \frac{1}{3}x + 2$$

Where $x$ is the initial height, in meters, and $x$ must be greater than 4. If the maximum height, in meters, the ball reaches after bouncing once is half the initial height, what is the initial height the ball should be released?

A)  2
B)  6
C)  12
D)  24

### 11

$$y = 2(2a)^{x+1} - a$$

If the exponential function above is graphed in the XY-plane, what is the value of y-intercept assuming $a$ is a constant?

A)  $-a$
B)  $a$
C)  $2a$
D)  $3a$

### 12

An uber drivers charges a basic fare of $3.25 plus $0.60 for every $\frac{1}{4}$ of a mile driven. If the total charge for a ride is $32.05, what is the total distance traveled, in miles?
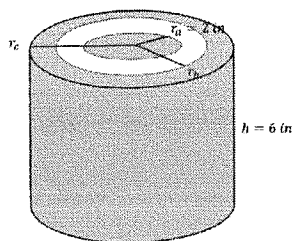
WEEK6.2

**2**     Module 1     **2**


**13**

$$4 \le -2x$$
$$-y - 1 \le 0$$

In the system of inequalities above, which of the following ordered pairs $(x, y)$ satisfies the system?

M) $(0, 0)$
N) $(-3, -5)$
O) $(0, 2)$
P) $(-3, 0)$

**14**



The cutout of electric wire is shown above. The most inner portion is the place for all electric wires and the white portion of the cylinder is non-conductive material to insulate electricity and the outer most portion is plastic rubber (PVC) to bend freely. If the radius of the inner most portion, $r_a$, is 2 mm and $r_c = 2r_b = 3r_a$ in the figure, what is the ratio of volumes of white portions to the entire volume?

A) $\dfrac{5}{36}$
B) $\dfrac{8}{9}$
C) $\dfrac{1}{9}$
D) $\dfrac{1}{4}$

**15**

Summer Class Enrollments in ABC Community College

| Class Enrollments | Sun | Mon | Tue | Wed | Thu | Fri | Sat | Total |
|---|---|---|---|---|---|---|---|---|
| Calculus | 23 | 12 | 8 | 10 | 6 | 12 | 2 | 73 |
| Physics | 45 | 6 | 7 | 20 | 8 | 11 | 7 | 134 |

The table above shows summer class enrollment distribution during the registration week in ABC Community College. Based on the data, by how much does the median number of enrollments in Calculus class exceed the median number of enrollments in Physics class during the 7 days?

**16**

In the XY-plane, the graph of $y = x^2 + ax + b$, where $a$ and $b$ are constants, has two x-intercepts at (2, 0) and (-4, 0). What is the sum of $a + b$?

A) -10
B) 10
C) -6
D) 6

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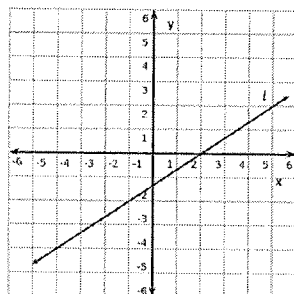Copyright @ PETER'S SAT MATH


CONTINUE

**17**

$$-3x^2 + 6x - 3y^2 - 3y - 1 = 0$$

In the circle equation above, what is the coordinates of the center of the circle?

A)  $(-1, \frac{1}{2})$

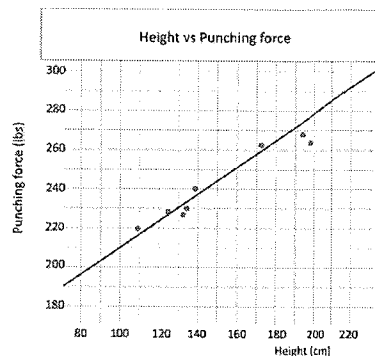B)  $(1, \frac{1}{2})$

C)  $(1, -\frac{1}{2})$

D)  $(1, -1)$

**18**



In the XY-plane above, line $l$ is shown above. If another line $m$ (not shown) is perpendicular to the line $l$, which of the following could be the equation of line $m$?

A)  $2x + 3y = 2$

B)  $3x + 2y = -1$

C)  $2x - 3y = 9$

D)  $3x - 2y = 3$

**19**



The scatter plot above shows the punching force, in lbs., and the height of the person, in cm, of 8 people as well as the line of best fit for the data. Which of the following best represents an equation of the line of best fit?

A)  $y = 0.67x + 190$

B)  $y = 0.67x + 143$

C)  $y = 1.5x + 190$

D)  $y = 1.5x + 143$

**20**

$$(2ax + 3)(x - 1) - x^2 + 3$$

In the equation above, $a$ is a constant. If the expression is equal to $mx$, where $m$ is a constant, what is the value of $m$?

CONTINUE

After math final exam, a math teacher found out that mean score for class A is at least 20 points lower than class B. If the mean score for class B is y and the mean score for class A is x, which of the following correctly represents this situation?

A) $y \geq x + 20$
B) $y \leq x + 20$
C) $y = x + 20$
D) $y \leq x - 20$

Edison, an electric power company, charges $k$ for monthly basic fee plus $0.07 per kilowatt-hour (kWh) of electricity in a certain area. If Philip paid $123.14 for the electric bill for a certain month, which of the following expressions could be used to find how many kilowatt-hours (kWh) of electricity did he use for that month?

A) $\dfrac{123.14 - k}{0.07}$

B) $123.14 - k - 0.07$

C) $\dfrac{123.14 - 0.07}{k}$

D) $\dfrac{123.14 - 100k}{0.07}$

## 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.