18

In triangle ABC, angle B is a right angle, point D lies on $\overline{AB}$, point E lies on $\overline{AC}$, and $\overline{DE}$ is perpendicular to $\overline{AC}$. If the length of $\overline{AB}$ is 12 units, the length of $\overline{AC}$ is 13 units, and the length of $\overline{DE}$ is 3 units, what is the length of $\overline{AE}$, in units?

19

In triangle ABC, $AB = 6$, $BC = 6$, and the measure of angle ABC is $120°$. What is the area of triangle ABC ?

A) $2\sqrt{3}$
B) $4\sqrt{3}$
C) $6\sqrt{3}$
D) $9\sqrt{3}$

20

Square $ABCD$ has a side length of 12. Point F lies on $\overline{BC}$, and $\overline{AF}$ and $\overline{BD}$ intersect at point E. The length of $\overline{BF}$ is 4. What is the length of $\overline{BE}$?

A) 3
B) $2\sqrt{2}$
C) $3\sqrt{2}$
D) $4\sqrt{2}$

21

A right triangle has a perimeter of $78 + 78\sqrt{3}$ centimeters and an angle measuring $30°$. What is the length, in centimeters, of the shortest side of this triangle?

A) 26
B) $26\sqrt{3}$
C) 39
D) $39\sqrt{3}$

22

In triangle QRS, angle Q is a right angle and $\overline{QT}$ is an altitude of the triangle. The length of $\overline{QS}$ is 15 units and the length of $\overline{RS}$ is 17 units. What is the length of $\overline{TS}$ to the nearest tenth of a unit?

A) 12.6
B) 12.8
C) 13.2
D) 13.4

23

In triangle WXY, point Z lies on $\overline{WY}$, and the measures of $\angle W$ and $\angle YXZ$ are each $36°$. Which of the following ratios is equal to $\frac{WY}{XY}$?

A) $\frac{WX}{XZ}$
B) $\frac{XY}{WX}$
C) $\frac{XY}{YZ}$
D) $\frac{YZ}{XZ}$

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1

A right triangle has legs with lengths of 11 centimeters and 9 centimeters. What is the length of this triangle's hypotenuse, in centimeters?

A) $\sqrt{40}$
B) $\sqrt{202}$
C) 20
D) 202

2

For the linear function h, the graph of $y = h(x)$ in the xy-plane passes through the points (7, 21) and (9, 25). Which equation defines h?

A) $h(x) = \frac{1}{2}x - \frac{7}{2}$
B) $h(x) = 2x + 7$
C) $h(x) = 7x + 21$
D) $h(x) = 9x + 25$

3

A company that produces socks wants to estimate the percent of the socks produced in a typical week that are defective. A random sample of 310 socks produced in a certain week were inspected. Based on the sample, it is estimated that 12% of all socks produced by the company in this week are defective, with an associated margin of error of 3.62%. Based on the estimate and associated margin of error, which of the following is the most appropriate conclusion about all socks produced by the company during this week?

A) 3.62% of the socks are defective.
B) It is plausible that between 8.38% and 15.62% of the socks are defective.
C) 12% of the socks are defective.
D) It is plausible that more than 15.62% of the socks are defective.

4

A truck can haul a maximum weight of 5,630 pounds. During one trip, the truck will be used to haul a 190-pound piece of equipment as well as several crates. Some of these crates weigh 25 pounds each and the others weigh 62 pounds each. Which inequality represents the possible combinations of the number of 25-pound crates, x, and the number of 62-pound crates, y, the truck can haul during one trip if only the piece of equipment and the crates are being hauled?

A) $25x + 62y \leq 5{,}440$
B) $25x + 62y \geq 5{,}440$
C) $62x + 25y \leq 5{,}630$
D) $62x + 25y \geq 5{,}630$

5

$$y - 9x = 13$$
$$5x = 2y$$

What is the solution (x, y) to the given system of equations?

A) $\left(\frac{5}{2}, 1\right)$
B) $\left(1, \frac{2}{5}\right)$
C) $(-2, -5)$
D) $(-5, -2)$

6

23, 27, 27, 32, 35, 36, 52

What is the range of the 7 scores shown?

29

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The Official SAT Study Guide 2nd Ed – Practice Test 5

7

Two customers purchased the same kind of bread and eggs at a store. The first customer paid 12.45 dollars for 1 loaf of bread and 2 dozen eggs. The second customer paid 19.42 dollars for 4 loaves of bread and 1 dozen eggs. What is the cost, in dollars, of 1 dozen eggs?

A) 3.77
B) 3.88
C) 4.15
D) 4.34

8

$$y = 18$$
$$y = -3(x - 18)^2 + 15$$

If the given equations are graphed in the xy-plane, at how many points do the graphs of the equations intersect?

A) Exactly one
B) Exactly two
C) Infinitely many
D) Zero

9

$$y = x + 9$$
$$y = x^2 + 16x + 63$$

A solution to the given system of equations is (x, y). What is the greatest possible value of x?

A) -6
B) 7
C) 9
D) 63

10

In the xy-plane, line p has a slope of $-\frac{5}{3}$ and an x-intercept of $(-6, 0)$. What is the y-coordinate of the y-intercept of line p?

11

How many solutions does the equation $12(x - 3) = -3(x + 12)$ have?

A) Exactly one
B) Exactly two
C) Infinitely many
D) Zero

12

Kaylani used fabric measuring 5 yards in length to make each suit for a men's choir. The relationship between the number of suits that Kaylani made, x, and the total length of fabric that she purchased y, in yards, is represented by the equation $y - 5x = 6$. What is the best interpretation of 6 in this context?

A) Kaylani made 6 suits.
B) Kaylani purchased a total of 6 yards of fabric.
C) Kaylani used a total of 6 yards of fabric to make the suits.
D) Kaylani purchased 6 yards more fabric than she used to make the suits.

13

Which quadratic equation has no real solutions?

A) $x^2 + 14x - 49 = 0$
B) $x^2 - 14x + 49 = 0$
C) $5x^2 - 14x - 49 = 0$
D) $5x^2 - 14x + 49 = 0$

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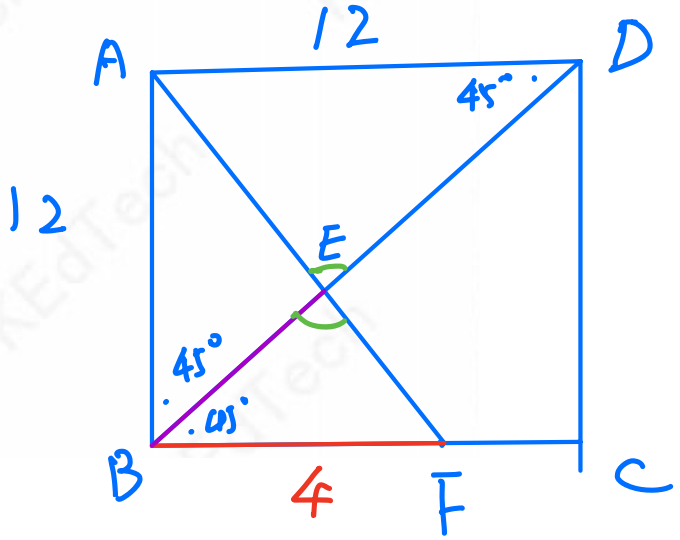
CONTINUE

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20

Square $ABCD$ has a side length of 12. Point F lies on $\overline{BC}$, and $\overline{AF}$ and $\overline{BD}$ intersect at point E. The length of $\overline{BF}$ is 4. What is the length of $\overline{BE}$?

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$\angle AED \cong \angle BEF$

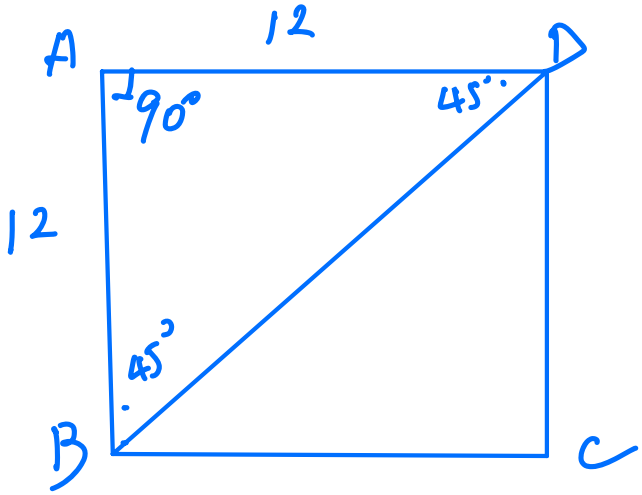
$\angle ADB \cong \angle DBF$

$AD \parallel BF \Rightarrow \angle DAF \cong \angle EFB$

A - A - A

$\triangle AED \sim \triangle BEF$ $\quad \frac{4}{12} = \frac{BF}{AD} = \frac{BE}{ED} = \frac{1}{3}$

$3BE = ED$ $\quad BD = BE + ED = BE + 3BE = 4BE$



$BD = 12\sqrt{2} = 4BE$

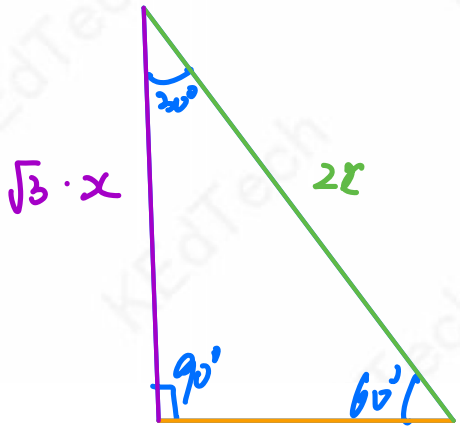
$\frac{12\sqrt{2}}{4} = 3E$

$BE = 3\sqrt{2}$

21

A right triangle has a perimeter of $78 + 78\sqrt{3}$ centimeters and an angle measuring 30°. What is the length, in centimeters, of the shortest side of this triangle?

A) 26
B) $26\sqrt{3}$
C) 39
D) $39\sqrt{3}$



30°-60°-90°

(1)

$x + \sqrt{3} \cdot x + 2x = 78 + 78\sqrt{3}$

$3x + \sqrt{3} \cdot x = 78 + 78\sqrt{3}$

$3x = 78$ $\quad 3x = 78$

x

$x = 26$

(2)

$\sqrt{3} \cdot x = 78$

$\sqrt{3} \cdot x = 78\sqrt{3}$

$x = 78$

$x = \frac{78}{\sqrt{3}} = \frac{78 \cdot \sqrt{3}}{\sqrt{3} \cdot \sqrt{3}} = \frac{78 \cdot \sqrt{3}}{3}$

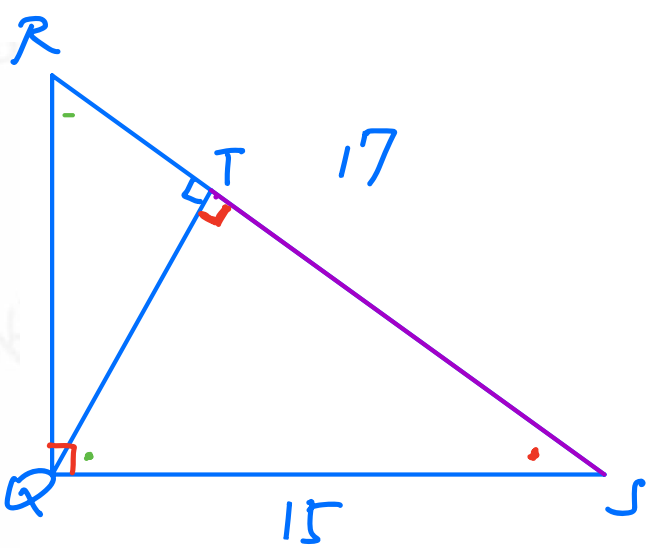
$= 26\sqrt{3}$

$3x = 78\sqrt{3}$ $\quad x = 26\sqrt{3}$

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A) 12.6
B) 12.8
C) 13.2
D) 13.4



$\triangle QTS \sim \triangle RQS$

$\angle S = \angle S$, $\angle QTS = \angle RQS$

$\angle R = \angle TQS$

$\frac{TS}{QS(=15)} = \frac{QS(=15)}{RS(=17)}$

$TS \cdot RS(=17) = QS^2 (= 15^2)$

$TS = \frac{15^2}{17} \approx 13.2$

23

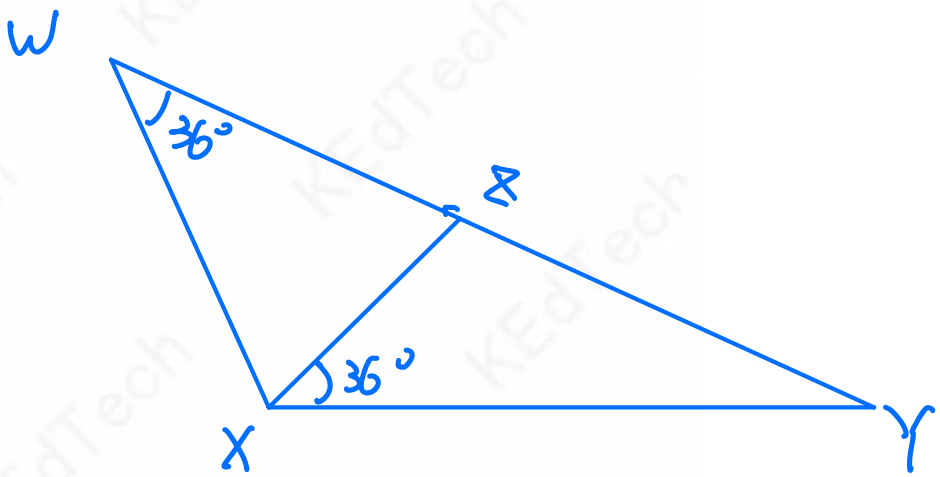
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B) $\frac{XY}{WX}$

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D) It is plausible that more than 15.62% of the socks are defective.

$12\% + 3.62\% = 15.62\%$

$12\% - 3.62\% = 8.38\%$

$8.38\% < x < 15.62\%$

4

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D) $62x + 25y \geq 5{,}630$

$190 + 25x + 62y \leq 5630$

$25x + 62y \leq 5630 - 190$

$25x + 62y \leq 5,440$

10

In the xy-plane, line p has a slope of $-\frac{5}{3}$ and an x-intercept of $(-6, 0)$. What is the y-coordinate of the y-intercept of line p? -10

$y = kx + b$ $\quad k = -\frac{5}{3}$

$y = -\frac{5}{3}x + b$ $\quad (-6, 0)$

$0 = -\frac{5}{3} \cdot (-6) + b$

$0 = \frac{5}{3} \cdot 6^2 + b$

$0 = 10 + b$

$0 - 10 = 10 - 10 + b$

$-10 = b$

11

How many solutions does the equation $12(x - 3) = -3(x + 12)$ have?

A) Exactly one

B) Exactly two

C) Infinitely many

D) Zero

$12(x-3) = -3(x+12)$

$12x - 36 = -3x - 36$

$12x + 3x - 36 = -3x + 3x - 36$

$15x - 36 = -36$

$15x - 36 + 36 = -36 + 36$

$15x = 0$

$x = 0$