Robot Quiz 1

30. A triangle has sides of length 2.5 feet and 4 feet. Which of the following CANNOT be the length of the third side, in feet?

F. 1
G. 2
H. 3
J. 4
K. 5

31. For all $a > 0$, $\frac{1}{a} + \frac{2}{3} = ?$

A. $\frac{2}{3a}$

B. $\frac{3}{3a}$

C. $\frac{3 + 2a}{3a}$

D. $\frac{3}{3 + a}$

E. $\frac{3 + 2a}{3 + a}$

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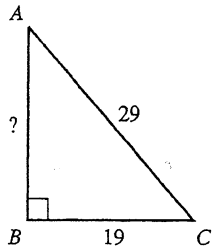
32. In the right triangle below, how long is side $\overline{AB}$?

DO YOUR FIGURING HERE.



F. $\sqrt{29^2 - 19^2}$

G. $\sqrt{29^2 + 19^2}$

H. $29^2 - 19^2$

J. $29^2 + 19^2$

K. $29 - 19$

33. If the length of a square is increased by 1 inch and the width is increased by 2 inches, a rectangle is formed. If each side of the original square is x inches long, what is the area of the new rectangle, in square inches?

A. $2x + 3$

B. $4x + 6$

C. $x^2 + 2$

D. $x^2 + 3x + 2$

E. $x^2 + 3x + 3$

34. If $\sin \alpha = \frac{12}{13}$, and $\cos \alpha = \frac{5}{13}$, then $\tan \alpha = ?$

F. $\frac{5}{12}$

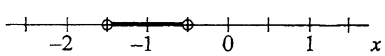
G. $\frac{7}{13}$

H. $\frac{12}{5}$

J. $\frac{17}{13}$

K. $\frac{60}{13}$

35. Which of the following best describes the graph on the number line below?



A. $|x| = -1$

B. $|x| < 0.5$

C. $-2 < x < 0$

D. $-0.5 < x < -1.5$

E. $-0.5 > x > -1.5$

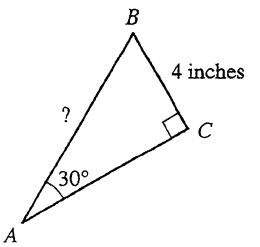
GO ON TO THE NEXT PAGE.

DO YOUR FIGURING HERE.

36. A performance was rated on a 3-point scale by an audience. A rating of 1 was given by 30% of the audience, a rating of 2 by 60%, and a rating of 3 by 10%. To the nearest tenth, what was the average of the ratings?

F. 1.2
G. 1.5
H. 1.8
J. 2.0
K. 2.2

37. In the right triangle below, if $\overline{BC}$ is 4 inches long, how many inches long is $\overline{AB}$?



A. 4
B. $4\sqrt{2}$
C. $4\sqrt{3}$
D. 6
E. 8

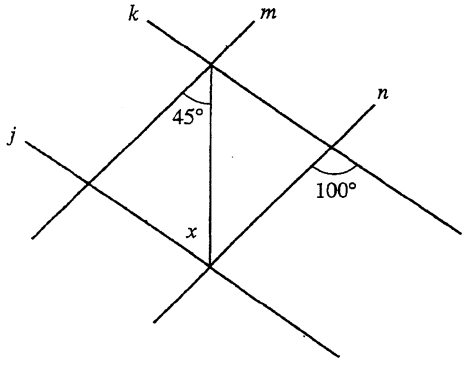
38. What is the largest possible product for 2 even integers whose sum is 38 ?

F. 72
G. 76
H. 136
J. 280
K. 360

GO ON TO THE NEXT PAGE.

DO YOUR FIGURING HERE.

39. In the figure below, lines j and k are parallel, lines m and n are parallel, and the measures of 2 angles are shown. What is the measure of $\angle x$?



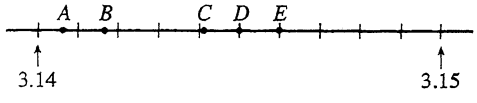
A. 45°
B. 55°
C. 65°
D. 75°
E. 80°

40. In the (x,y) coordinate plane, what is the y-intercept of the line $6x - 2y = 6$?

F. –3
G. –2
H. 0
J. 3
K. 6

41. Among the points graphed on the number line below, which is closest to π ?

(Note: $\pi \approx 3.1415926$)



A. A
B. B
C. C
D. D
E. E

42. For what value of a would the following system of equations have an infinite number of solutions?

$$2x - y = 6$$
$$8x - 4y = 3a$$

F. 2
G. 6
H. 8
J. 18
K. 24

GO ON TO THE NEXT PAGE.

43. The expression $(180 - x)$ is the degree measure of a nonzero acute angle if and only if:

A. $0 < x < 45$
B. $0 < x < 90$
C. $45 < x < 90$
D. $90 < x < 135$
E. $90 < x < 180$

DO YOUR FIGURING HERE.

44. If $x + y = -2$, and $x - y = -3$, then $x^2 - y^2 = ?$

F. 13
G. 6
H. 5
J. -5
K. -6

45. The sides of a triangle are 5, 12, and 13 inches long. What is the angle between the 2 shortest sides?

A. 30°
B. 45°
C. 60°
D. 90°
E. 120°

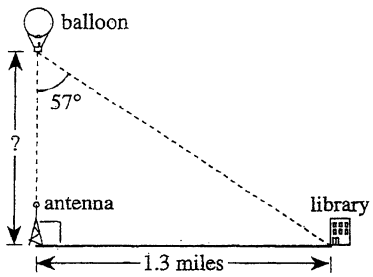
46. In the standard (x,y) coordinate plane, if the x-coordinate of each point on a line is 4 less than twice its y-coordinate, the slope of the line is:

F. -4
G. -2
H. $\frac{1}{2}$
J. 2
K. 4

GO ON TO THE NEXT PAGE.

DO YOUR FIGURING HERE.

47. From a hot air balloon, the angle between a radio antenna straight below and the base of the library downtown is 57°, as shown below. If the distance between the radio antenna and the library is 1.3 miles, how many miles high is the balloon?



A. $1.3 \sin 57°$

B. $1.3 \tan 57°$

C. $\frac{1.3}{\sin 57°}$

D. $\frac{1.3}{\cos 57°}$

E. $\frac{1.3}{\tan 57°}$

48. Two numbers have a greatest common factor of 4 and a least common multiple of 24. Which of the following could be the pair of numbers?

F. 4 and 8
G. 4 and 12
H. 8 and 12
J. 8 and 24
K. 12 and 24

49. Listed below are 5 functions, each denoted $g(x)$ and each involving a real number constant $c \geq 2$. If $f(x) = 2^x$, which of these 5 functions yields the greatest value for $f(g(x))$, for all $x > 1$?

A. $g(x) = cx$

B. $g(x) = \frac{c}{x}$

C. $g(x) = \frac{x}{c}$

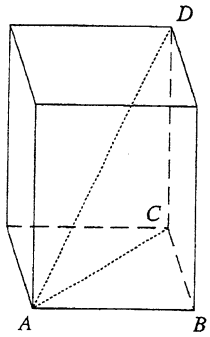
D. $g(x) = x - c$

E. $g(x) = \log_c x$

GO ON TO THE NEXT PAGE.

50. Line segments $\overline{AB}$, $\overline{BC}$, and $\overline{CD}$, which represent the 3 dimensions of the rectangular box shown below, have lengths of 4 inches, 3 inches, and 5 inches, respectively. What is the sine of $\angle DAC$?

DO YOUR FIGURING HERE.



F. 1

G. $\frac{4}{5}$

H. $\frac{\sqrt{2}}{2}$

J. $\frac{3}{5}$

K. $\frac{3\sqrt{2}}{10}$