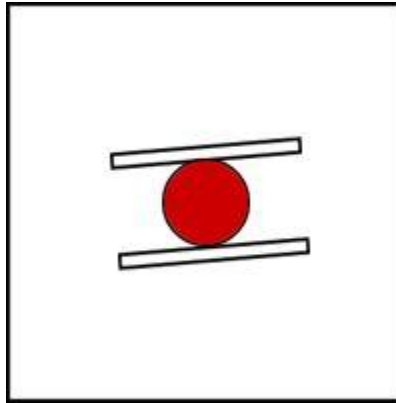


A Doodle for the S.A.T. Math Exam with a calculator

A puzzle by David Pleacher



"A Doodle is a borkley looking sort of drawing that doesn't make any sense until you know the correct title." – Roger Price

Captions for the picture:

#1 $\frac{20}{7} \frac{18}{19} \frac{16}{9} \frac{19}{1} \frac{20}{14} \frac{25}{19} \frac{14}{15} \frac{19}{1} \frac{15}{10} \frac{1}{24} \frac{23}{23} \frac{4}{4}$.

#2 $\frac{7}{14} \frac{19}{12} \frac{9}{11} \frac{1}{17} \frac{1}{13} \frac{14}{10} \frac{12}{24} \frac{11}{20} \frac{17}{4} \frac{13}{21} \frac{17}{8} \frac{13}{15} \frac{7}{7} \frac{8}{8} \frac{22}{22} \frac{15}{15}$.

#3 $\frac{4}{4} \frac{18}{18} \frac{20}{20} \frac{1}{1} \frac{25}{25} \frac{6}{6} \frac{18}{18} \frac{15}{15} \frac{21}{21} \frac{3}{3} \frac{11}{11} \frac{14}{14}$.

#4 $\frac{20}{20} \frac{22}{22} \frac{5}{5} \frac{24}{24} \frac{15}{15} \frac{6}{6} \frac{20}{20} \frac{25}{25} \frac{2}{2} \frac{24}{24} \frac{23}{23} \frac{3}{3} \frac{8}{8} \frac{2}{2} \frac{19}{19}$

$\frac{23}{23} \frac{4}{4} \frac{17}{17} \frac{13}{13} \frac{22}{22} \frac{5}{5} \frac{10}{10} \frac{11}{11} \frac{20}{20} \frac{4}{4} \frac{23}{23} \frac{4}{4} \frac{25}{25} \frac{2}{2} \frac{21}{21} \frac{20}{20} \frac{24}{24} \frac{23}{23} \frac{12}{12} \frac{21}{21}$.

To determine the title to this doodle, solve the 25 math problems which are similar to problems found on the S.A.T. math section (using a calculator).

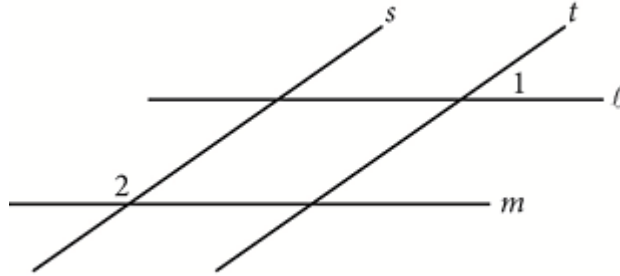
Then find the answers to each problem from the choices listed.

Replace each numbered blank with the letter corresponding to the answer for that problem.

___ 1. If $y = kx$, where k is a constant, and $y = 24$ when $x = 6$, what is the value of y when $x = 5$?

- M. 6 O. 15 D. 20 E. 23

___ 2. In the figure below, lines ℓ and m are parallel and lines s and t are parallel. If the $m\angle 1 = 35^\circ$, what is the measure of $\angle 2$?



- S. 35° T. 55° E. 70° P. 145°

___ 3. The table below shows some values of the linear function f .

n	1	2	3	4
$f(n)$	-2	1	4	7

Which of the following defines f ?

- A. $f(n) = n - 3$
R. $f(n) = 2n - 4$
K. $f(n) = 3n - 5$
S. $f(n) = 4n - 6$

___ 4. At Rocky Mountain High School, approximately 7 percent of enrolled juniors and 5 percent of enrolled seniors were inducted into the National Honor Society last year. If there were 562 juniors and 602 seniors enrolled at Rocky Mountain High School last year, which of the following is closest to the total number of juniors and seniors at Rocky Mountain High School last year who were inducted into the National Honor Society?

- M. 30 P. 39 H. 69 S. 140

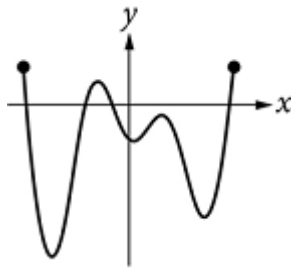
___ 5. If $\frac{3}{5}w = \frac{4}{3}$, what is the value of w ?

- V. $\frac{9}{20}$ A. $\frac{4}{5}$ R. $\frac{5}{4}$ Y. $\frac{20}{9}$

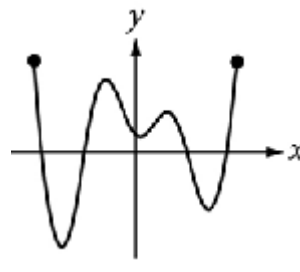
___ 6. Barbara walks 25 meters in 13.7 seconds. If she walks at this same rate, which of the following is closest to the distance she will walk in 4 minutes?

- A. 150 meters
G. 450 meters
E. 700 meters
D. 1,400 meters

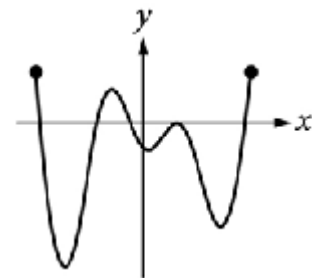
___ 7. If the function f has five distinct zeros, which of the following could represent the complete graph of f in the xy -plane?



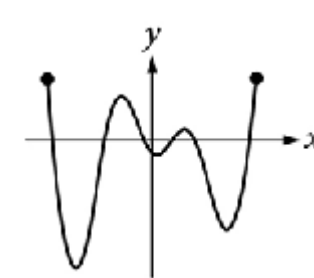
C.



U.



B.



E.

- ___ 8. The equation $h = -16t^2 + vt + k$ gives the height h , in feet, of a ball t seconds after it is thrown straight up with an initial speed of v feet per second from a height of k feet. Which of the following gives v in terms of h , t , and k ?

P. $v = h + k - 16t$

L. $v = \frac{h - k + 16}{t}$

U. $v = \frac{h - k}{t} + 16t$

S. $v = \frac{h + k}{t} - 16t$

- ___ 9. To make a bakery's signature chocolate muffins, a baker needs 2.5 ounces of chocolate for each muffin. How many pounds of chocolate are needed to make 48 signature chocolate muffins? (1 pound equals 16 ounces.)

L. 7.5

I. 10

N. 50.5

E. 120

- ___ 10. The weight of an object on Venus is approximately $\frac{9}{10}$ of its weight on Earth.

The weight of an object on Jupiter is approximately $\frac{23}{10}$ of its weight on Earth.

If an object weighs 100 pounds on Earth, approximately how many more pounds does it weigh on Jupiter than it weighs on Venus?

L. 90

A. 111

W. 140

S. 230

- ___ 11. An online bookstore sells novels and magazines. Each novel sells for \$4, and each magazine sells for \$1. If Audrey purchased a total of 11 novels and magazines that have a combined selling price of \$20, how many novels did she purchase?
- D. 2
 - I. 3
 - S. 4
 - K. 5
- ___ 12. The Downtown Business Association (DBA) in Fort Collins plans to increase its membership by a total of n businesses per year. There were b businesses in the DBA at the beginning of this year. Which function best models the total number of businesses, y , the DBA plans to have as members x years from now?
- K. $y = nx + b$
 - I. $y = nx - b$
 - T. $y = n(b)^x$
 - E. $y = b(n)^x$
- ___ 13. Which of the following is an equivalent form of $(1.5x - 2.4)^2 - (5.2x^2 - 6.4)$?
- T. $-22x^2 + 1.6$
 - E. $-22x^2 + 11.2$
 - R. $-2.95x^2 - 7.2x + 12.16$
 - M. $-2.95x^2 - 7.2x + 0.64$
- ___ 14. The graph of which of the following equations is perpendicular to the graph of $-2x + 3y = 6$?
- S. $3x + 2y = 6$
 - K. $3x + 4y = 6$
 - E. $2x + 4y = 6$
 - W. $2x + 6y = 3$

___ 15. Determine the value of x in the solution of the system of equations

$$\frac{1}{2}y = 4$$
$$x - \frac{1}{2}y = 2$$

- M. 3
- E. 3.5
- A. 4
- N. 6

___ 16. Which of the following ordered pairs satisfies the following system of inequalities?

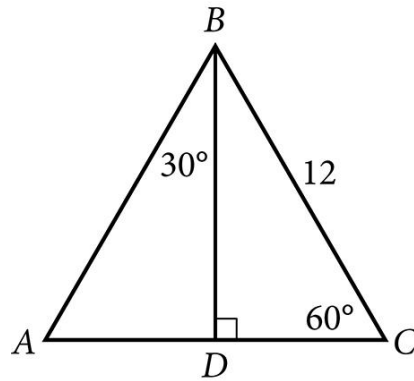
$$y \leq 3x + 1$$
$$x - y > 1$$

- E. $(-2, -1)$
- X. $(-1, 3)$
- A. $(1, 5)$
- M. $(2, -1)$

___ 17. A polling agency recently surveyed 1,000 adults who were selected at random from a large city and asked each of the adults, "Are you satisfied with the quality of air in the city?" Of those surveyed, 78 percent responded that they were satisfied with the quality of air in the city. Based on the results of the survey, which of the following statements must be true?

1. Of all adults in the city, 78 percent are satisfied with the quality of air in the city.
 2. If another 1,000 adults selected at random from the city were surveyed, 78 percent of them would report they are satisfied with the quality of air in the city.
 3. If 1,000 adults selected at random from a different city were surveyed, 78 percent of them would report they are satisfied with the quality of air in the city.
- E. None
 - G. 2 only
 - A. 1 and 2 only
 - D. 1 and 3 only

___ 18. In $\triangle ABC$ below, what is the length of \overline{AD} ?



- C. 4
- O. 6
- N. $6\sqrt{2}$
- E. $6\sqrt{3}$

___ 19. In the equation $\frac{a-b}{a} = c$, if a is negative and b is positive, which of the following must be true?

- A. $c > 1$
- X. $c = 1$
- I. $c = -1$
- S. $c < -1$

___ 20. In Colorado, Mr. Harding's eighth-grade class consisting of 26 students was surveyed and 34.6 percent of the students reported that they had at least two siblings. The average eighth-grade class size in the state is 26. If the students in Mr. Harding's class are representative of students in the state's eighth-grade classes and there are 1,800 eighth-grade classes in the state, which of the following best estimates the number of eighth-grade students in the state who have fewer than two siblings?

- B. 16,200
- Y. 23,400
- T. 30,600
- E. 46,800

___ 21. The surface area of a cube is $6\left(\frac{a}{4}\right)^2$ where a is a positive constant.

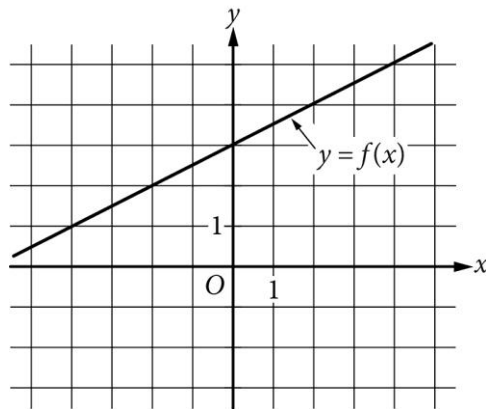
Which of the following gives the perimeter of one face of the cube?

- I. $\frac{a}{4}$
- S. a
- B. $4a$
- N. $6a$

___ 22. The mean score of 8 players in a basketball game was 14.5 points. If the highest individual score is removed, the mean score of the remaining 7 players becomes 12 points. What was the highest score?

- Z. 20
- E. 24
- R. 32
- O. 36

___ 23. The graph of the linear function f is shown below. The slope of the graph of the linear function g is 4 times the slope of the graph of f . If the graph of g passes through the point $(0, -4)$, what is the value of $g(9)$?

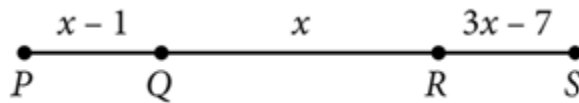


- L. 5
- O. 9
- C. 14
- I. 18

___ 24. The equation $x^2 + 20x + y^2 + 16y = -20$ defines a circle in the $x y$ plane.
What are the coordinates of the center of the circle?

- L. $(-20, -16)$
- I. $(-10, -8)$
- N. $(10, 8)$
- E. $(20, 16)$

___ 25. Given segment \overline{PS} , $PQ = RS$, $PQ = x - 1$, $QR = x$, $RS = 3x - 7$.
What is the length of \overline{PS} ?



- P. 4
- L. 5
- O. 7
- T. 9

The doodle used in this puzzle was drawn by Roger Price and appeared in his book called *Doodles*.