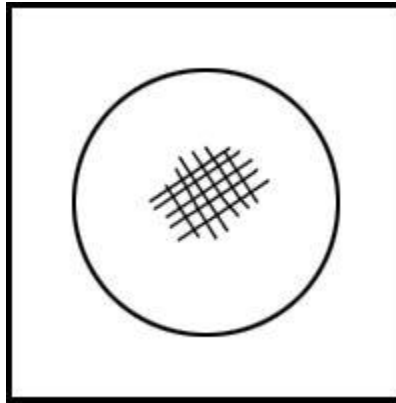


A Doodle for the S.A.T. Math Exam with a calculator

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 $\frac{14}{18} \frac{5}{16} \frac{23}{16} \frac{24}{19} \frac{11}{12} \frac{6}{20} \frac{11}{7}$.

#2 $\frac{21}{15} \frac{10}{9} \frac{18}{5} \frac{7}{21} \frac{25}{19} \frac{1}{7} \frac{6}{19} \frac{4}{4}$

$\frac{21}{9} \frac{1}{18} \frac{23}{20} \frac{25}{15} \frac{1}{23}$.

#3 $\frac{22}{3} \frac{17}{7} \frac{18}{19} \frac{4}{4} \frac{21}{22} \frac{17}{12} \frac{6}{18} \frac{7}{7} \frac{7}{15}$

$\frac{21}{23} \frac{1}{8} \frac{18}{24} \frac{2}{13} \frac{20}{23} \frac{17}{7} \frac{25}{17} \frac{15}{7} \frac{18}{1} \frac{1}{1}$.

To determine the titles 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. Which expression is equivalent to $(2x^2 - 4) - (-3x^2 + 2x - 7)$?
- R. $5x^2 - 2x + 3$
 A. $5x^2 + 2x - 3$
 T. $-x^2 - 2x - 11$
 E. $-x^2 + 2x - 11$
- ___ 2. A website hosting service charges businesses a onetime setup fee of \$350 plus d dollars for each month. If a business owner paid \$1,010 for the first 12 months, including the setup fee, what is the value of d ?
- V. 25
 E. 35
 R. 45
 B. 55
- ___ 3. The table below shows a summary of 1,200 responses to a survey question. Based on the table, how many of those surveyed get most of their medical information from either a doctor or the Internet?

Where Do People Get Most of Their Medical Information?

Source	Percent of those surveyed
Doctor	63%
Internet	13%
Magazines or brochures	9%
Pharmacy	6%
Television	2%
Other or none of the above	7%

- K. 865
 I. 887
 L. 912
 O. 926

- ___ 4. The following table shows the flavors of ice cream and the toppings chosen by the people at a party. Each person chose one flavor of ice cream and one topping. Of the people who chose vanilla ice cream, what fraction chose hot fudge as a topping?

Ice Cream and Topping Selections

		Flavor	
		Vanilla	Chocolate
Topping	Hot fudge	8	6
	Caramel	5	6

- H. $\frac{8}{25}$
- A. $\frac{5}{13}$
- L. $\frac{13}{25}$
- F. $\frac{8}{13}$
- ___ 5. The total area of a coastal city is 92.1 square miles, of which 11.3 square miles is water. If the city had a population of 621,000 people in the year 2010, which of the following is closest to the population density, in people per square mile of land area, of the city at that time?
- I. 6,740
- N. 7,690
- C. 55,000
- H. 76,000
- ___ 6. What is the sum of the solutions to $(x-6)(x+0.7)=0$?
- E. -6.7
- C. -5.3
- H. 5.3
- O. 6.7

___ 7. Given the equation $9ax + 9b - 6 = 21$, what is the value of $ax + b$?

- T. 3
- E. 6
- R. 8
- M. 12

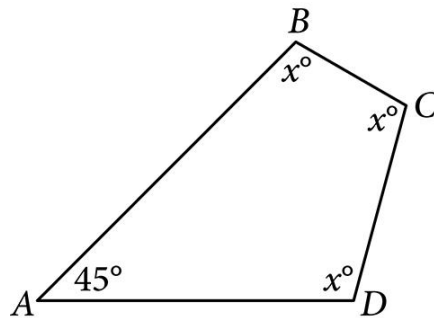
___ 8. Kate spent 15% of her 8 hour workday in meetings. How many minutes of her workday did she spend in meetings?

- W. 1.2
- A. 15
- V. 72
- E. 4,320

___ 9. A customer paid \$53.00 for a jacket after a 6 percent sales tax was added. What was the price of the jacket before the sales tax was added?

- A. \$47.60
- C. \$50.00
- R. \$52.60
- E. \$52.84

___ 10. In the following figure, what is the value of x ?



- A. 315
- X. 105
- I. 90
- S. 45

- ___ 11. If 50 one cent coins were stacked on top of each other in a column, the column would be approximately $3\frac{7}{8}$ inches tall.

At this rate, which of the following is closest to the number of one cent coins it would take to make an 8 inch tall column?

- C. 75
- U. 100
- B. 200
- E. 390

- ___ 12. If $a - b = 12$ and $\frac{b}{2} = 10$, what is the value of $a + b$?

- T. 2
- R. 12
- I. 32
- G. 52

- ___ 13. The equation $y = 19.99 + 1.50x$ models the total cost y , in dollars, that a company charges a customer to rent a truck for one day and drive the truck x miles. The total cost consists of a flat fee plus a charge per mile driven. When the equation is graphed in the x y - plane, what does the y - intercept of the graph represent in terms of the model?

- Y. A flat fee of \$19.99
- A. A charge per mile of \$1.50
- R. A charge per mile of \$19.99
- D. Total daily charges of \$21.49

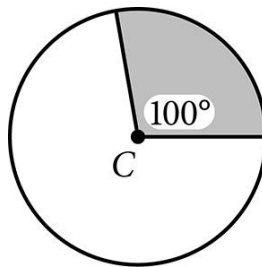
- ___ 14. A cylindrical can containing pieces of fruit is filled to the top with syrup before being sealed. The base of the can has an area of 75 centimeters squared, and the height of the can is 10 centimeters. If 110 centimeters cubed of syrup is needed to fill the can to the top, which of the following is closest to the total volume of the pieces of fruit in the can?

- H. 7.5 cm^3
- T. 185 cm^3
- M. 640 cm^3
- L. 750 cm^3

___ 15. The score on a trivia game is obtained by subtracting the number of incorrect answers from twice the number of correct answers. If a player answered 40 questions and obtained a score of 50, how many questions did the player answer correctly?

- G. 20
- R. 25
- I. 30
- D. 35

___ 16. In the figure below, point C is the center of the circle. What fraction of the area of the circle is the area of the shaded region?



- M. $\frac{1}{4}$
- O. $\frac{10\pi}{36}$
- D. $\frac{5}{18}$
- E. $\frac{25}{324}$

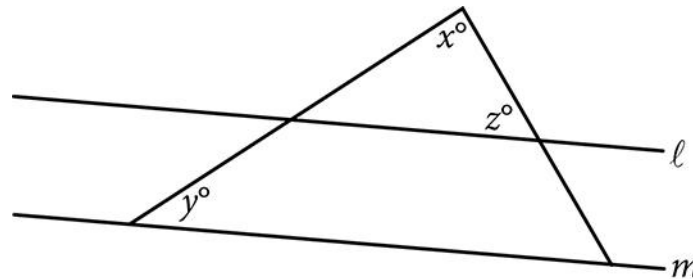
___ 17. If the ordered pair (x, y) satisfies the system of equations below, what is one possible value of x ?

$$\begin{cases} y = x^2 - 4x + 4 \\ y = 4 - x \end{cases}$$

- D. -3
- E. -2
- C. 2
- A. 3

- ___ 18. In a random sample of 200 cars of a particular model, 3 have a manufacturing defect. At this rate, how many of 10,000 cars of the same model will have a manufacturing defect?
- E. 150
 - X. 200
 - A. 250
 - M. 300

- ___ 19. In the figure below, lines l and m are parallel, y equals 20, and z equals 60. What is the value of x ?



Note: Figure not drawn to scale.

- W. 120
 - O. 100
 - R. 90
 - K. 80
- ___ 20. In the xy -plane, the graph of which of the following equations is a line with a slope of 3?
- C. $y = \frac{1}{3}x$
 - O. $y = x - 3$
 - N. $y = 3x + 2$
 - E. $y = 6x + 3$
- ___ 21. In the equation, $x + 1 = \frac{2}{x + 1}$, which of the following is a possible value of $x + 1$?

- C. 2
- U. $1 - \sqrt{2}$
- S. $\sqrt{2}$
- P. 4

___ 22. If $a^{-\frac{1}{2}} = x$, where $a > 0$, what is a in terms of x ?

M. \sqrt{x}

A. $-\sqrt{x}$

P. $\frac{1}{x^2}$

S. $-\frac{1}{x^2}$

___ 23. Which of the following is a value of x for which the expression $\frac{-3}{x^2 + 3x - 10}$ is undefined?

B. -3

A. -2

S. 0

E. 2

___ 24. The table below shows the distribution of ages of the 20 students enrolled in a college class. Which of the following gives the correct order of the mean, median, and mode of the ages?

D. mode < median < mean

I. mode < mean < median

S. median < mode < mean

K. mean < mode < median

Ages of 20 Students Enrolled in a College Class

Age	Frequency
18	6
19	5
20	4
21	2
22	1
23	1
30	1

___ 25. The equation $M = 1,800(1.02)^t$ models the number of members, M , of a gym t years after the gym opens. Of the following, which equation models the number of members of the gym q quarter years after the gym opens?

W. $M = 1,800(1.02)^{\frac{q}{4}}$

I. $M = 1,800(1.02)^{4q}$

S. $M = 1,800(1.05)^{4q}$

E. $M = 1,800(1.082)^q$

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