Sample SAT Prep. Questions from Problem-Attic

1 Rounded to the nearest whole number, what is $9800 \div 99$?

a) 19 b) 98 ∗c) 99 d) 100 e) 119

2 How many tenths are there in 1.2?

a) 24 ∗b) 12 c) 10.2 d) 0.12 e) 0.06

3 If $\frac{a}{b} = \frac{5}{3}$, then $15b =$

∗a) $9a$ b) $10a$ c) $12a$ d) $25a$ e) $45a$

4 In order to produce one gallon of green paint, 3 quarts of blue paint are mixed with 1 quart of yellow paint. What is the ratio of blue paint to yellow paint needed to produce 3 gallons of green paint?

∗a) 3 : 1 b) 4 : 1 c) 5 : 2 d) 7 : 5 e) 12 : 5

5 If $x = 7$, then $\sqrt{49 - 14x + x^2} =$

a) -2 ∗b) 0 c) 2 d) 3 e) 4

6 If $x^2 - 1 = 8 \times 3 \times 7$ and $x > 0$, then $x =$

a) 12 ∗b) 13 c) 14 d) 15 e) 16

7 If $\frac{150}{350} = \frac{p}{q}$, and $p + q$ is a positive integer, then the least value of $p + q$ is

a) 2 b) 5 ∗c) 10 d) 12 e) 50

8 If $0.0003x = 3$, then $\frac{x}{100} =$

a) $33\frac{1}{3}$ b) 11 ∗c) 100 d) 10 e) $3.\overline{3}$

9 If $ab = 9$ and $a^2 + b^2 = 16$, then $(a + b)^2 =$

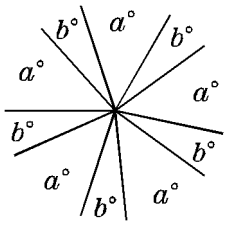
a) 5 b) 25 ∗c) 34 d) 49 e) 100

10 The product of three integers, each greater than 1, is 18. What is the sum of the three integers?

a) 7 ∗b) 8 c) 9 d) 10 e) 12

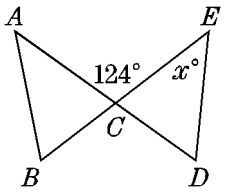
11 If x is three more than one-third of y, then y, expressed in terms of x, is

a) $x - 9$ b) $x - 1$ c) $x + 1$ ∗d) $3(x - 3)$ e) $3(x + 3)$



12 In the figure, $a = 2b$. Find the value of a.

a) 24 ∗b) 48 c) 52 d) 60 e) 72

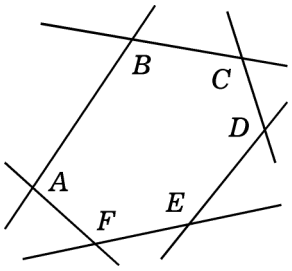


13 In the figure, if $CD = CE$, then $x =$

a) 28 b) 34 c) 56 ∗d) 62 e) 68

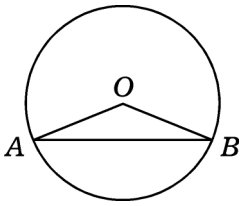
14 A man walks 3 miles due east, then 4 miles due north, then 5 miles due east. How far is he from his starting point?

a) 10 miles b) 12 miles ∗c) $4\sqrt{5}$ miles d) $5\sqrt{3}$ miles e) $8\sqrt{2}$ miles



15 In the hexagon shown above, $m\angle A = 100^\circ$, $m\angle B = 108^\circ$, and $m\angle C = 120^\circ$. What is $m\angle D + m\angle E + m\angle F$?

a) 380° ∗b) 392° c) 398° d) 400° e) 404°



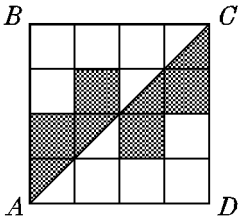
16 The measure of $\angle OAB$ is 36°. If O is the center of the circle, then the number of degrees in $\angle AOB$ is

∗a) 108 b) 126 c) 136 d) 144

e) It cannot be determined from the information given.

17 If the edges of a cube are each doubled, what is the percent of increase in its volume?

a) 100% b) 300% c) 600% ∗d) 700% e) 800%



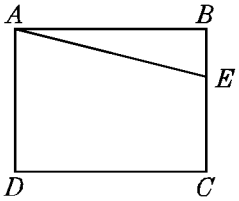
18 Each side of square $ABCD$ above is four units long. What is the area in square units of the shaded portion?

a) 4 b) 5 ∗c) 6 d) 7 e) 8

19 The coordinates of A and B are $(-2a, -b)$ and $(6a, 3b)$, respectively. Express, in terms of a and b, the coordinates of the midpoint of $\overline{AB}$.

a) $(-12a, -4b)$ b) $(-6a, -2b)$ c) $(a, 3b)$

∗d) $(2a, b)$ e) $(4a, 2b)$



20 In the figure, the area of rectangle $ABCD$ is 72. If $BE = \frac{1}{3}BC$, then the area of triangle ABE is what fraction of the area of the rectangle?

a) $\frac{2}{7}$ b) $\frac{2}{9}$ ∗c) $\frac{1}{6}$ d) $\frac{1}{8}$ e) $\frac{1}{12}$

21 If exactly two of the three integers ℓ, m, and n are odd, which of the following must be odd?

I. $\ell + mn$

II. $\frac{\ell m}{n}$

III. $2\ell mn$

∗a) I only b) II only c) I and II only

d) I and III only e) none of these

22 Which of the following could be the remainders when 3 consecutive positive integers are each divided by 3?

a) 1, 0, 1 b) 2, 1, 2 c) 2, 0, 2 ∗d) 1, 2, 0 e) 1, 2, 1

23 Given:

$K = \{\ldots, -3, -2, -1, 0, 1, \ldots\}$
$M = \{\ldots, -3, -2, -1, 0\}$
$R = \{0, 1, 2, 3\}$

Determine which of the following statements are true about the sets listed above.

I. set K is a subset of set M

II. set M is a subset of set K

III. set R is a subset of set K

a) I only b) II only ∗c) II and III only

d) I and III only e) I, II and III

24 Assume a ball bounces to height of $\frac{3}{5}$ of the height from which it falls. If the ball is dropped from a height of 18 feet, after which bounce will the rebound height be less than 1 foot?

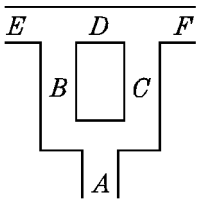
a) 3 b) 4 c) 5 ∗d) 6 e) 7

25 The average (arithmetic mean) of three numbers is 15. If one of the three numbers is 7, what is the sum of the other two?

a) 8 b) 14 c) 22 d) 23 ∗e) 38

26 How many integers between 1 and 100 begin or end with 2?

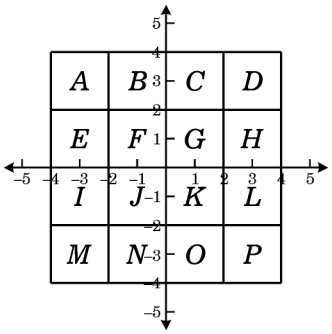
a) 10 b) 11 ∗c) 19 d) 20 e) 29



27 In the maze shown, rats enter at point A and exit at points E or F without retracing their paths. If $\frac{1}{2}$ of the rats pass point D and exit at point F, and $\frac{1}{4}$ of the rats pass point C and exit at point F, what fraction of rats *never* pass point B and exit at point E?

a) $\frac{1}{8}$ b) $\frac{1}{4}$ c) $\frac{1}{3}$ d) $\frac{2}{2}$

∗e) It cannot be determined from the information given.



28 Squares A through P are placed in an eight by eight square as shown in the figure above. Assuming a dart randomly strikes the interior region of the square, what is the probability that the dart lands in square G?

a) $\frac{1}{32}$ ∗b) $\frac{1}{16}$ c) $\frac{1}{8}$ d) $\frac{1}{4}$ e) $\frac{1}{2}$

29 Solve: $\frac{2}{3}x - \frac{1}{4} = \frac{1}{12}x$

a) $-\frac{2}{7}$ b) $-\frac{3}{7}$ c) $\frac{2}{7}$ ∗d) $\frac{3}{7}$ e) $\frac{3}{5}$

30 Simplify $2x^{-1} + x^{-2}$

a) $\frac{2}{x^2 + x}$ b) $-\frac{2}{x^2 + x}$ c) $\frac{1}{x^2 + 2x}$ d) $-\frac{1}{x^2 + 2x}$ ∗e) $\frac{2x + 1}{x^2}$

31 If y is directly proportional to x and if $y = 2$ when $x = 8$, what is the value of x when $y = 6$?

a) 8 b) 12 ∗c) 24 d) 30 e) 36

32 If $f(x) = x^2 - 2x - 3$, what is the value of $f(f(2))$?

a) -6 b) 5 c) 9 ∗d) 12 e) 15

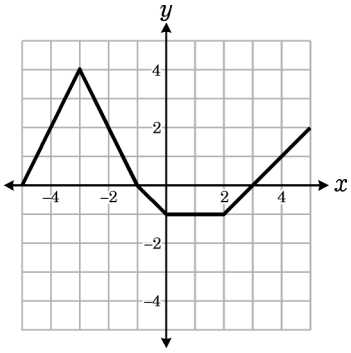
33 What is the domain of the function $f(x) = \frac{1}{\sqrt{x^2 - 4}}$ over the set of real numbers?

a) $\{x \mid x \neq -2\}$ b) $\{x \mid x \neq 4\}$ c) $\{x \mid x < -2\}$

d) $\{x \mid -4 < x < 4\}$ ∗e) $\{x \mid x < -2 \text{ or } x > 2\}$

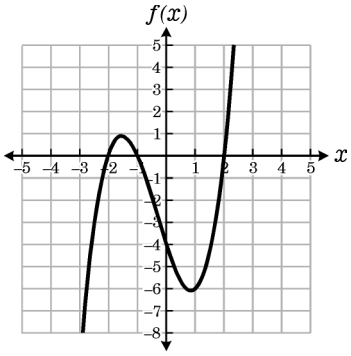
34 If f is a linear function and $f(-1) = -8$ and $f(6) = 6$, what is the x-intercept of the graph of f?

a) -3 b) -1 c) 2 d) $\frac{5}{2}$ ∗e) 3



35 The figure above shows the graph of function f. If the function g is defined by $g(x) = f(1 - 2x) + 1$, what is the value of $g(2)$?

a) -4 b) -3 c) 1 d) 3 ∗e) 5



36 The figure above shows the graph of cubic function f. Which function represents f?

a) $f(x) = x^3 + 2x^2 - 2x + 1$

b) $f(x) = x^3 - 2x^2 - 2x + 1$

c) $f(x) = x^3 + 2x^2 - 2x - 1$

∗d) $f(x) = x^3 + x^2 - 4x - 4$

e) $f(x) = x^3 + 2x^2 - 4x + 4$

37

$$\begin{array}{r} 3\square \\ \square 4 \\ \square 8 \\ +\ 4\square \\ \hline 192 \end{array}$$

In the correctly computed addition problem above, if $\square$ always represents the same digit, then $\square$ equals

a) 1 b) 2 c) 3 d) 4 ∗e) 5

38 If $x = 7$, then $\sqrt{49 - 14x + x^2} =$

a) -2 ∗b) 0 c) 2 d) 3 e) 4

39 If $\dfrac{x+y}{x-y} = \dfrac{z}{y-x}$, then z is equal to

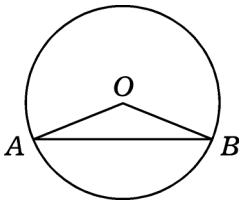
a) -1 b) $-x+y$ ∗c) $-x-y$ d) $2y$ e) $2y-x$

40 If $pq - p = 6$ and $\dfrac{1}{p} - \dfrac{1}{q-1} = \dfrac{2}{3}$, then $q - p =$

a) 3 b) 4 ∗c) 5 d) 6 e) 7

41 A person can run m miles in n hours and 20 minutes. What is her average speed in miles per hour?

a) $m\left(n + \frac{1}{3}\right)$ b) $\dfrac{m}{n+20}$ ∗c) $\dfrac{m}{n+\frac{1}{3}}$ d) $\dfrac{n+20}{m}$ e) $\dfrac{n+\frac{1}{3}}{m}$



42 The measure of $\angle OAB$ is 36°. If O is the center of the circle, then the number of degrees in $\angle AOB$ is

∗a) 108 b) 126 c) 136 d) 144

e) It cannot be determined from the information given.

43 In a coordinate graph system, the diagonal of a rectangle has end points of $(1, 2)$ and $(-3, -4)$. What is the area of the rectangle?

a) 16 b) 20 ∗c) 24 d) 28 e) 32

44 A square is drawn inside a circle such that the vertices of the square lie on the circle. If the square has side $\sqrt{2}$, then the area of the circle is

a) $\frac{\pi}{4}$ b) $\frac{\pi}{2}$ ∗c) π d) $\sqrt{2}\pi$ e) 2π

45 If a is any element from set A, and b is any element from set B, how many different values are possible for $a + b$?

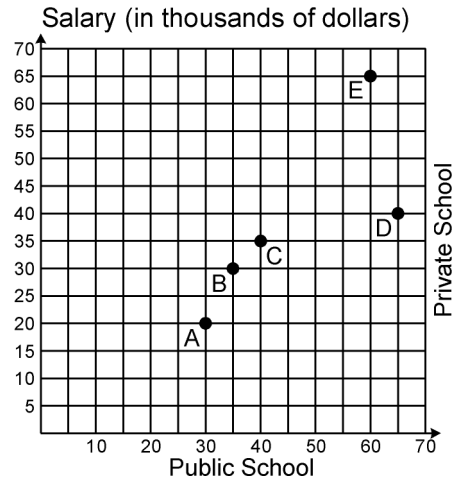
Set A: $\{-2, 0, 2, 4\}$

Set B: $\{-1, 0, 1, 3\}$

a) 5 b) 7 ∗c) 10 d) 12 e) 16

46 Your swimming pool is filled with 12,000 gallons of water. Each day 2% of the water is lost to evaporation. How many days will it take the pool to drop below 10,000 gallons?

a) 8 b) 9 ∗c) 10 d) 11 e) 12



47 The scatterplot above shows the differences in salary per year (in thousands of dollars) of school teachers who changed jobs from a public to a private school. For which teacher was the change in salary the greatest?

a) A b) B c) C ∗d) D e) E

48 The following equations are satisfied where a, b, x, and y are all greater than zero.

$$x^{-\frac{2}{3}} = a^{-4}$$
$$y^{\frac{3}{4}} = b^{3}$$

What is $(xy)^{\frac{1}{2}}$ in terms of a and b?

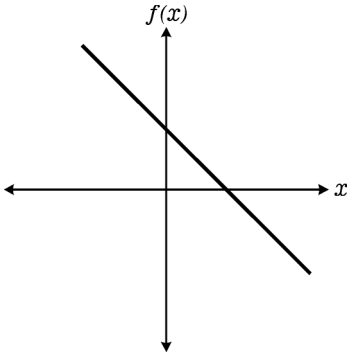
a) a^2b^3 ∗b) a^3b^2 c) a^2b^4 d) a^4b^2 e) a^2b

49 The sum s of the terms of a geometric progression is given by the formula

$$s = \frac{r\ell - a}{r - 1}$$

where the first term is a, the last term is ℓ, and the common ratio is r. What is the value of a when $s = 250$, $r = 3$, and $\ell = 165$?

∗a) -5 b) 1 c) 2 d) 5 e) 162



50 The figure shows the graph of linear function f. Determine which of the following statements are true about function f.

I. Function f has a negative slope.

II. Function f has two zeros.

III. Function f has a positive y-intercept.

a) I only
b) II only
c) III only
∗d) I and III only
e) I, II and III