Digital SAT December Azerbaijan(Real Exam)

1)

$$y = a^x - b$$

The exponential function given above passes through $(c; 7)$ and $(2c; 247)$ points What is the possible value of b?

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2)

$$f(x) = 9,000(0.66)^x$$

The given function f models the number of advertisements a company sent to its clients each year, where a represents the number of years since 1997, and $0 \leq x \leq 5$. If y = f(x) is graphed in the xy-plane, which of the following is the best interpretation of the y-intercept of the graph in this context?

A) The minimum estimated number of advertisements the company sent to its clients during the 5 years was 1,708.

B)The minimum estimated number of advertisements the company sent to its clients during the 5 years was 9,000.

C) The estimated number of advertisements the company sent to its clients in 1997 was 1,708.

D) The estimated number of advertisements the company sent to its clients in 1997 was 9,000.

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3)

A 12-pound cat eats two types of canned can food: chicken-flavored and chick flavored.
The recommended amount of chicken flavored food is 22.5 cans per 8 pounds of a cat's weight per day. The recommended amount of duck flavored food is 1.75 cans per 9 pounds of a cat's weight per day. If c is the number of chicken-flavored cans and d is the number of duck flavored cans a 12-pounds cat eats in one day. Which equation describes all possible values of c and d?

A)

$$\frac{1.75}{9}c + \frac{2.25}{8}d = 12$$

C)

$$\frac{9}{1.75}c + \frac{8}{2.25}d = 12$$

B)

$$\frac{2.25}{8}c + \frac{1.75}{9}d = 12$$

D)

$$\frac{8}{2.25}c + \frac{9}{1.75}d = 12$$

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4)

Cylinder	Volume	Surface Area
A	300 π	kπ
B	37,500 π	nπ

Two similar cylinder are given above with above with volume of 300π and 37,500π. If the radius of the base of Cylinder A is 10 cm. What is the value of $n - k$?

$Volume = \pi r^2 h$

$Surface\ Area = 2\pi r^2 + 2\pi rh$

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5)

A quadratic function models the height, in feet, of an object above the ground in terms of the time, in seconds, after the object is launched off an elevated surface. The model indicates the object launched from the ground (0 feet) and reaches its maximum height of 1782 feet above the ground 9 seconds after being launched. Based on the model, what is the height, in feet, of the object above the ground 12 seconds after being launched?
A. 594
B. 778
C. 970
D. 1,584

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6)

$(x + 9)$ is a factor of the quadratic function $y = f(x)$, $x = c$ is zero of the function. If the **vertex point** of the function is $(-2.75; d)$, what is the value of c ?

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7)

The vertex of the function $f(x)$ is given as $(8, -10)$, and the point $(7, -12)$ lies on the parabola. If $g(x) = 4f(x)$, what is the value of $g(0) - f(0)$?

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8)

$0.28x^2 + 0.4x + 0.84$

The given expression can be rewritten as $a(7x^2 + 10x + 21)$, where a is a constant. What is the value of a ?

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9)

Value	Frequency
11	4
12	1
13	3
14	0

Value	Frequency
15	10

What is the minimum value of data in the table above ?

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10)

Sample	Percent in favor	Margin of Error
A	75.3%	10.1%
B	73.3%	6.8%

The results of two random samples of votes for a proposition are shown above. The samples were selected from the same population, and the margins of error were calculated using the same method. Which of the following is the most appropriate reason that the margin of error for sample A is greater than the margin of error for sample B?

A) Sample A had a smaller number of votes that could not be recorded.

B) Sample A had a higher percent of favorable responses.

C) Sample A had a larger sample size.

D) Sample A had a smaller sample size.

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11)

For two acute angles, $\angle A$ and $\angle B$, $cosA = sinB$.
The measures, in degrees, of
$\angle A$ and $\angle B$ are $5x + 10$ and $40 + 3x$, respectively. What is the value of x?

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12)

A certain store earned total of $\$1700$ this year, and the equation $10x + 15y = 1700$ represents the situation, where x is the number of short-sleeved shirts and y is the number of long-sleeved shirts the store sold during the year. What is the best interpretation of 15 in the equation?

A) Number of short-sleeved shirts

B) Number of long-sleeved shirts

C) Price of each short-sleeved shirt

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D) Price of each long-sleeved shirt

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13)

The math tutor charges each student $200 for the first month and $150 for each additional month. Which of the following functions correctly represents the total revenue R(m), in dollars, for m months and n students, where m and n are positive integers?

A) $R(m) = 150mn + 50$

B) $R(m) = 150mn + 200$

C) $R(m) = 150mn + 50n$

D) $R(m) = 150mn + 200n$

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14)

In the town of Springfield, the population is increasing by 3% each year. The initial population, recorded at the beginning of the year, is 10,000 residents. The town council is interested in modeling this population growth for future planning. Which of the following functions best represents the population P(t) in terms of time t, measured in years, where P(0) is the initial population?

A) $P(t) = 10,000(0.03)^t$

B) $P(t) = 10,000(0.97)^t$

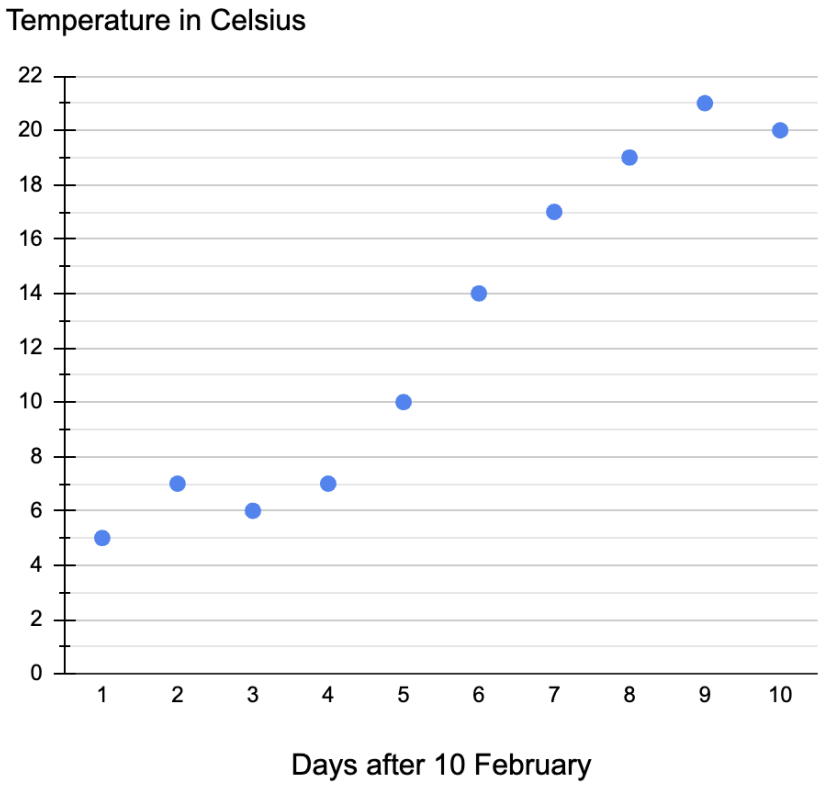
C) $P(t) = 10,000(1.03)^t$

D) $P(t) = 10,000(1.97)^t$

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15)

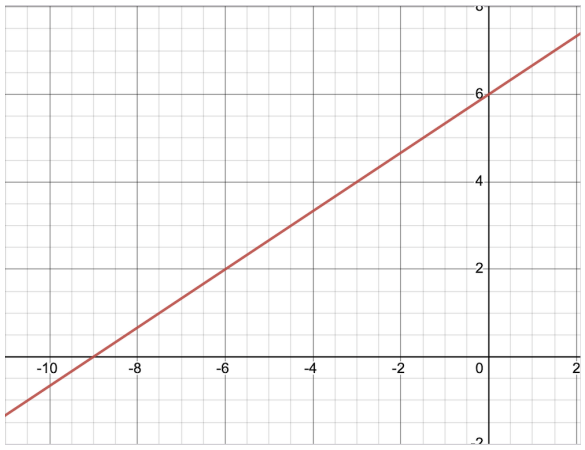
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The scatter plot above displays temperatures for each day after February 10th in Celsius. What is the average temperature increase per day from February 13th to February 15th?

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16)



Which of the following function is line that perpendicular to the line above and passes through $(12; -8)$?

A) $f(x) = \frac{2}{3}x + 6$

B) $f(x) = \frac{2}{3}x - 16$

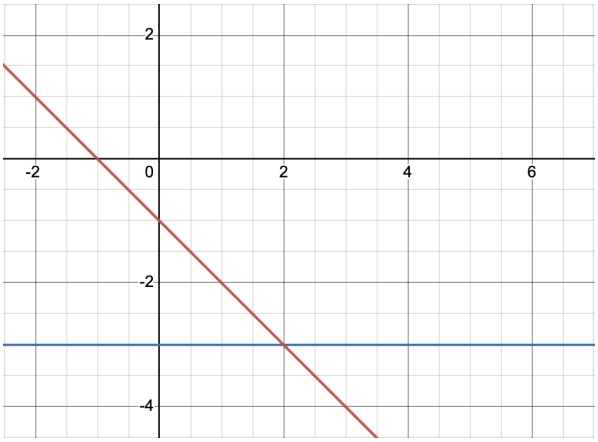
C) $f(x) = -\frac{3}{2}x + 6$

D) $f(x) = -\frac{3}{2}x + 10$

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17)

x	f(x)
0	1
1	0
2	-1
3	-2
4	-3



How many solutions two linear equation(at right) and f(x)(at left) have?

A) Zero

B) Exactly one

C) Exactly two

D) Infinitely many

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18)

$$2x = 20$$
$$2x - 3y = 2$$

If the $(a; b)$ is the solution of both equations above, what is the value of b?

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19)

$$12x - 132 = x$$

What is the value of x ?

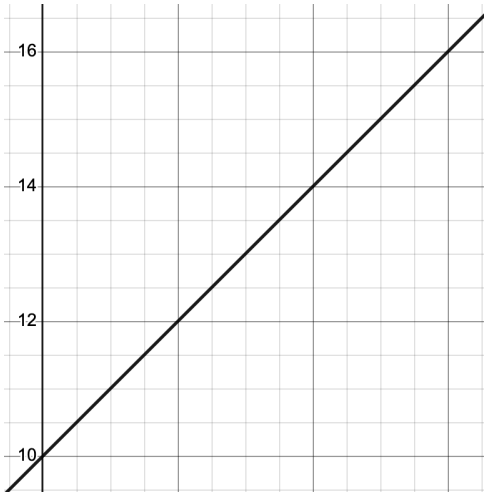
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20)

What is the slope of line which is parallel to $2x - 12y = 20$?

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21)



The worker receives a one-time payment and an hourly charge from the customer. The function above shows the total earnings of the worker from each customer. What is the best interpretation of the slope of the line above?

A) The number of hours the worker work

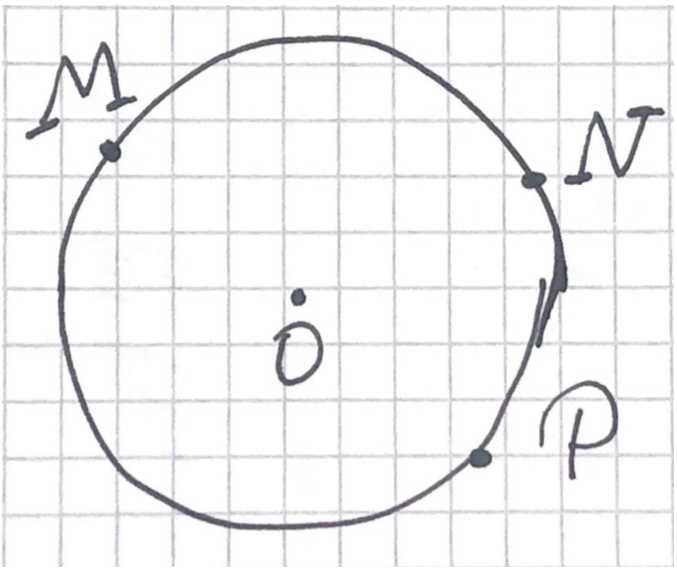
B) The worker’s hourly earning.

C) The total earnings the worker.

D) The price of equipments.

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22)



For the circle above, minor arc MN is 18 cm and major arc MPN is 38 cm. What is the circumference of the circle ?

23)

The area of a rectangle is 360 square inches. The length of the rectangle is 40 inches. What is the width, in inches, of this rectangle?

24)

$$f(x) = \sqrt{2x + 7}$$

What is the value of f(9) ?

25)

$$f(x) = 8x$$

For what value of x, $f(x) = 88$?

26)

If a person runs with 9 meter per second, how many second it requires to run 120 meter ?

27)

240,000 meter squared of 300,000 meter squared land is useful for crop. How many percent of land is useful for crops ?

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28)

Data Set	Values
A	1, 2, 4, 5, 5.
B	1, 2, 4, 10

Which statement is correctly about means of data sets above ?

A) Mean of data set A is greater than mean of data set B

B) Mean of data set A is smaller than mean of data set B

C) Mean of data set A equal to mean of data set B

D) There is no enough information

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29)

What is the x-intercept of $y = \frac{3}{7}x + 21.$

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30)

$$f(x) = x - 5$$
$$g(x) = x^2 + rx + 25$$
$$f(x) \cdot g(x) = x^3 - 125$$
$$r = ?$$

If the product of $f(x)$ and $g(x)$ is $x^3 - 125$, what is the value of r ?

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31)

In $ABCD$ square AC is a diagonal of the square and equal to 43. Which of the following is correct ?

A) $\overline{AB} + \overline{BD} = 86$

B) $\overline{AB} = \overline{BD}$

C) $\angle ABC = \angle CAB$

D) $\triangle ABC = \triangle ACD$

32)

A waitress earns at least $20 and at most $30 each day. Which of the following inequalities shows all total possible earning for 5 weeks ?

A) $20 \leq x \leq 30$

B) $20 \cdot 5 \leq x \leq 30 \cdot 5$

C) $20 \cdot 35 \leq x \leq 30 \cdot 35$

D) $30 \cdot 35 \leq x \leq 20 \cdot 35$

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33)+

$$(x - 44)^2 = 1$$

What is the sum of roots of the equation above?

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34)+

In triangle RST, $\angle T = 23^\circ$ and angle $\angle R = 55^\circ$, point L lies on RS, point K lies on ST, and LK is parallel to RT. What is the value of $\angle LKS$?

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35)+

$x = -\frac{y}{115j}$

Find j in terms of x and y ?

A) $j = -\frac{115x}{y}$

B) $j = -\frac{115y}{x}$

C) $j = -\frac{y}{115x}$

D) $j = -\frac{x}{115y}$

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36)+

Consider the exponential function $B(t) = a \cdot 2^t$, where t represents the number of days and
$B(t)$ represents the number of bacteria in a population. If $B(4) = 1444$,
what is the best interpretation of this value?

A) The population of bacteria is 1444 on the 4th day.

B) After 4 days, there are 1444 more bacteria in the population.

C) The population of bacteria doubles every 4 days.

D) After 1444 days, the population of bacteria will reach 4.

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37)

Consider the function $f(t) = -240 + 20t$, where t represents the number of units sold and $240 represent daily cost of running bakery, $f(t)$ represents the total profit generated. What is the best interpretation of the term 20t in this context?

A) Total cost

B) Total revenue generated from selling units

C) Price of each unit

D) Profit of each unit.

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38)

The function f is defined by $f(x) = (x-5)(x-4)(x+5)$. In the xy-plane, the graph of $y = g(x)$ is the result of translating the graph of $y = f(x)$ 4 units up. What is the value of $g(0) = ?$

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39)

$$|x-3| = \frac{k}{2}$$

If the equation above has only one solution, what is the value of k?

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40)

$$\frac{x-4}{4} = \frac{x-4}{9}$$

Which of the intervals below include the value of the $x-4$?

A) 3 and 8

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B) -2 and 2

C) -8 and -3

D) 4 and 9



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