LGEG

MATHEMATICS **NAME**_____

TEACHER: SOFIA **GROUP**__F2_____

GRADE-UPS

Final score:_____

Part A (3 points for each correct answer)

1. Solve the system of equations giving the answer in the form (x, y):

$$\begin{cases} 2x + 4y = 8 \\ 4x + 2y = 8 \end{cases}$$

A. $\left(\frac{4}{3}, \frac{4}{3}\right)$ B. $\left(1, \frac{3}{2}\right)$ C. $(2, 1)$ D. $(1, 2)$

2. Solve the following task:

Vova made two numbers and Susan is trying to guess them. Vova gave Susan two hints: the second number is greater than the first by 8 and their product (the result of multiplication) is 20. Find these two numbers and give the result of the division of the greater number by the smaller one as your answer.

A. 2 B. 5 C. 10 D. 20

3. Solve the equation: $\frac{3}{2+x} = 6$

A. $-\frac{8}{2}$ B. $-\frac{3}{2}$ C. $\frac{1}{2}$ D. $\frac{3}{2}$

4. Solve the equation: $x^2 - 12x + 20 = 0$

If it has more than one solution give the sum of roots as your answer.

A. 0 B. 2 C. 10 D. 12

5. Solve the inequality: $4x - 3 < 2$

A. $x < 0.75$ B. $x < 1.25$ C. $x > \frac{5}{4}$ D. $x < 2$

6. Simplify and evaluate the expression $\frac{(xyz)^2 * (2xy^2z^3)^1}{(x^3z^3y^2) * (2yz)^2}$

A. 0.5 B. 1 C. 2 D. 4

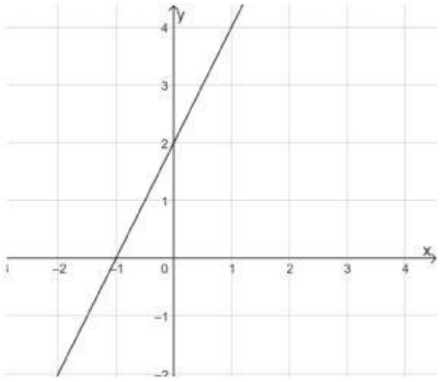
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7. Find the equation of the line shown on the graph:

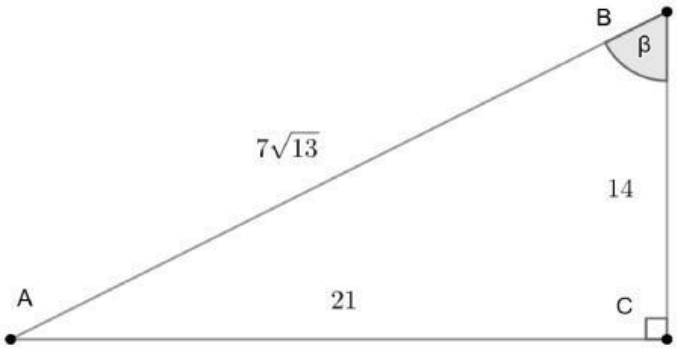


A. $y = x + 1$ B. $y = 2x + 2$ C. $y = 2x - 1$ D. $y = -x + 2$

8. Find the value of $\cos\angle BAC$ in a right triangle ABC ($\angle C = 90°$), if $\sin\angle BAC = 0.6$

A. 0.64 B. 0.8 C. $\frac{2}{3}$ D. 0.4

9. Find the value of $\sin\beta$ in the picture below (triangle ABC is right, $AB = 7\sqrt{3}, BC = 14$)



A. $\frac{2\sqrt{13}}{13}$ B. $\frac{3\sqrt{13}}{13}$ C. $\frac{3}{2}$ D. $\frac{\sqrt{13}}{3}$

10. Find XY of a right triangle XYZ ($\angle Y = 90°$), if $ZY = 11\sqrt{2}, ZX = 13\sqrt{7}$

A. $2\sqrt{5}$ B. $\sqrt{941}$ C. $3\sqrt{41}$ D. $5\sqrt{57}$

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Part B

Task 1 (5 points)

Factorize the quadratic expression $2x^2 - 14x + 24$

Task 2 (6 points)

Write down the binary representation of the decimal number 45

Task 3 (7 points)

A message was coded using the Ceasar's cypher. It is known that the letter A has been coded by either D, E or F. What are the letters in the coded text that could represent the letter K of the original text?

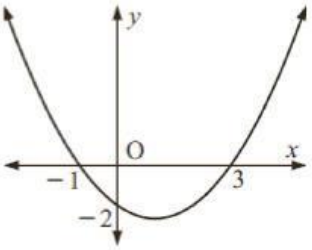
Task 4 (8 points)

Solve the system of simultaneous equations $\begin{cases} y = x^2 - 4x + 4 \\ y = 4 - x \end{cases}$

Task 5 (9 points)

The parabola on the graph on the right is given by the equation $y = ax^2 + bx + c$.

Find the values of a, b, and c



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