

Algebra 1 Team Test

FAMAT January Regional

Question 1:

Factor the following:

A.  $-9 + 4x^2$

B.  $3x - 9 + 2x^2$

C.  $2x^2 - 11x + 12$

D.  $2x^2 - x - 3$

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Question 2

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Evaluate each expression.

- A.  $\frac{2^{3x+2} \cdot (2^x)^2}{2^{5x-2}}$
- B.  $\frac{[(3^3)^x \cdot 3^{2x+2}]^{-1}}{3^{-5x}}$
- C.  $\frac{4^{3x+1}}{(4x+1)^2} \cdot 4^{-x+2}$
- D.  $\left(\frac{5^{-4x-3}}{5^{-3x} \cdot 5^{-x-2}}\right)^2$

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Question 3

Use the line formed by points A (4,6.5) and B (6.5,4) and a perpendicular line to line AB that goes through the point (4, 6.5)

- A. What is the slope of the line perpendicular to the line given?
- B. What is the x-intercept of the perpendicular line?
- C. What is the y coordinate when the x-coordinate is 2, of the perpendicular line?
- D. What is the y-intercept of the perpendicular line?

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## Question 4

Simplify each of the following inequalities.

$$A. 4 - 3(x + 1) + 7x + 1 \leq \frac{-5x+12+11x}{2} - 3$$

$$B. 3x + 6x + 7x - 14x - x > -3^2 - \frac{3-10+1}{\sqrt{7-3}} - (2 \cdot 3) + \frac{24}{4}$$

$$C. -\frac{3(5x-3)-2}{-(13-14)^5} \leq -\frac{2(8x-3)-2}{3^2-2^3}$$

$$D. \sqrt{\frac{32}{8}} - 15x - (5 - 2) \leq 2(2x) - (2 + 3)x - 15x - \left(\frac{5}{2} + \frac{4}{8}\right)$$

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## Question 5

Use the function  $y = -3(x + 2)^2 + (3x - 4)^2$ .

- A. Write the function in vertex form.
- B. What are the coordinates of intersection with the line  $y = 4$ ?
- C. What is the value of the discriminant?
- D. How many times will the graph of the function cross the x-axis?

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## Question 6

Write the equation of a line for each of the following situations in standard form.

- A. Parallel to  $y = \frac{1}{4}x + 2$  with x-intercept of - 8
- B. Perpendicular to  $y = \frac{4}{3}x + 17$  and passes through ( - 8, 2 )
- C. Passes through the points ( 0, - 5.5 ) and ( 4.5, - 10 )
- D. Has a slope of  $-\frac{1}{3}$  and passes through (2, 8)

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## Question 7

Solve the following systems of equations:

A. 
$$\begin{cases} 2x + y = -19 \\ 5x + y = 17 \end{cases}$$

B. 
$$\begin{cases} 2x + y = 9 \\ 4x - y = -15 \end{cases}$$

C. 
$$\begin{cases} y = 4 - 3x \\ 5x + 2y = -7 \end{cases}$$

D. 
$$\begin{cases} 2y + x = -4 \\ y - x = -5 \end{cases}$$

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C. 
$$\begin{cases} y = 4 - 3x \\ 5x + 2y = -7 \end{cases}$$

D. 
$$\begin{cases} 2y + x = -4 \\ y - x = -5 \end{cases}$$

Question 8

Round all answers to the nearest penny.

- A. Sarah bought Opal a new jacket that was on sale for 45% off. If Sarah paid \$15.75 for the jacket, what was the original price?
  
- B. Jeffrey bought Daisy a new jacket that was on sale for 35% off. If Jeffrey paid \$12.99 for the jacket, what was the original price?
  
- C. Kim bought Marley a new jacket that was on sale for 20% off. If Kim paid \$20.20 for the jacket, what was the original price?
  
- D. Debbie bought Hank a new jacket that was on sale for 70% off. If Debbie paid \$47.95 for the jacket, what was the original price?

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- D. Debbie bought Hank a new jacket that was on sale for 70% off. If Debbie paid \$47.95 for the jacket, what was the original price?



## Question 9

Write the quadratic equation in standard form for the following:

- A. Zeros at  $x = -\frac{3}{2}$  and  $x = 8$
- B. Zeros at  $x = -4$  and  $x = -\frac{5}{4}$
- C. Zeros at  $x = 0$  and  $x = -15$
- D. Zeros at  $x = \frac{5}{3}$  and  $x = 6$

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- C. Zeros at  $x = 0$  and  $x = -15$
- D. Zeros at  $x = \frac{5}{3}$  and  $x = 6$

Question 10

Solve

- A. What does Rob need to score on his next test in order to have a test average of 85, if his previous test grades were: 67, 78, and 95?
  
- B. What does Bill need to score on his next test in order to have a test average of 80, if his previous test grades were: 73, 78, and 85?
  
- C. What does Leslie need to score on her next test in order that have a test average of 92, if her previous test grades were: 88, 90, and 97?
  
- D. What does Nola need to score on her next test in order to have a test average of 75, if her previous test grades were: 88, 85 and 74?

Question 10

Solve

- A. What does Rob need to score on his next test in order to have a test average of 85, if his previous test grades were: 67, 78, and 95?
  
- B. What does Bill need to score on his next test in order to have a test average of 80, if his previous test grades were: 73, 78, and 85?
  
- C. What does Leslie need to score on her next test in order that have a test average of 92, if her previous test grades were: 88, 90, and 97?
  
- D. What does Nola need to score on her next test in order to have a test average of 75, if her previous test grades were: 88, 85 and 74?

Question 11

Solve the following:

A.  $x^4 - 9x^3 - 8x^2 + 72x = 0$

B.  $3x^3 + 6x^2 - 9x = 0$

C.  $3x^2 - 14x - 5 = 0$

D.  $9x^2 - 121 = 0$

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A.  $x^4 - 9x^3 - 8x^2 + 72x = 0$

B.  $3x^3 + 6x^2 - 9x = 0$

C.  $3x^2 - 14x - 5 = 0$

D.  $9x^2 - 121 = 0$

Question 12

Simply the following:

- A.  $(x - 2)(2x^2 + 4x - 7)$
- B.  $(2x^2 - 3x + 6)(-3x^2 + 4x - 2)$
- C.  $(2x - 3)(4x^2 + 6x + 9)$
- D.  $(5x + 4)(25x^2 - 20x + 16)$

Question 12

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- B.  $(2x^2 - 3x + 6)(-3x^2 + 4x - 2)$
- C.  $(2x - 3)(4x^2 + 6x + 9)$
- D.  $(5x + 4)(25x^2 - 20x + 16)$

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Question 13

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Simplify the following:

A.  $\frac{x^2+8x-9}{x-1}$

B.  $\frac{(x-7)(x^2-4)}{x^2+8x+12}$

C.  $\frac{(x+3)^2}{x^2+8x+15}$

D.  $\frac{x^2+5}{x^4-25}$

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C.  $\frac{(x+3)^2}{x^2+8x+15}$

D.  $\frac{x^2+5}{x^4-25}$

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Question 14

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What is the degree of the following?

A.  $y = 3 - 7x^3 + 2x(x - 4)(4x^2 + 3x - 1)$

B.  $y = 6x(2x + 5) - 8x^3(5x + 3)$

C.  $y = 3x^{-1}(2x^4 - x) + (x^2 - 4)(x + 4)$

D.  $y = (2x^2 + 5)(3x^3 - 5x + 2)$

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Question 14

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What is the degree of the following?

A.  $y = 3 - 7x^3 + 2x(x - 4)(4x^2 + 3x - 1)$

B.  $y = 6x(2x + 5) - 8x^3(5x + 3)$

C.  $y = 3x^{-1}(2x^4 - x) + (x^2 - 4)(x + 4)$

D.  $y = (2x^2 + 5)(3x^3 - 5x + 2)$

Question 15

Solve the following: Answers must be in fraction form.

- A. It takes Deloris 3 hours to clean the house and it takes Allan 4 hours to clean the house, if they work together how long does it take them to clean the house?
  
- B. It takes Jason 4 hours to clean the house. He works with his brother, Will, and they can clean the house in 2.5 hours. How long does it take Will to clean the house by himself?
  
- C. It takes Brian 3 hours to clean his house and if he works with Rob they can clean the house in 1.75 hours. How long does it take Rob to clean the house if he works by himself?
  
- D. It takes Leslie 3 hours to clean her house and if she works with Kate it takes them 2 hours to clean the house. How long does it take Kate to clean the house if she works by herself?

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