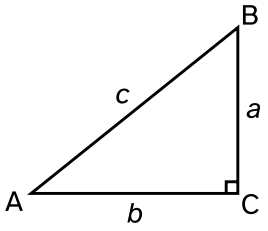
	Instituto Politénico Nacional		
	Unidad Profesional Interdisciplinaria de Ingeniería Campus Guanajuato		
	Subject Vectorial Calculus	**1st Partial Exam**	
Academy	Mathematics	**Date**	06/01/25
Teacher	Oswaldo Arias Estrada	**Class**	1AV1
Student		**Student ID**	
Exam ID	129302183-0-0	**Score**	/100

Instructions.

- Answer the following questions.
- You have 1 hour to complete the exam.
- Write your answers on the exam paper.

Question #1. (20 points). Solve for c, with $a = 62$ and $b = 75$.



Answer.

$$\begin{aligned} c &= \sqrt{a^2 + b^2} \\ &= \sqrt{62^2 + 75^2} \\ &= \sqrt{3844 + 5625} \\ &= \sqrt{9469} \\ &\approx 97.3088 \end{aligned}$$

Question #2. (15 points). A bag has 69 blue balls, 83 yellow balls, and 5 red balls. How many random balls must be drawn from the bag to ensure that at least one yellow ball is drawn?

Answer.
To ensure that at least one yellow ball is drawn, we must draw at least 75 balls.

Question #3. (35 points). For the function:

$$f(x) = x^5 + \sin(x^2) - \ln(x)e^x + 79$$

find the derivative.

Answer.

$$f'(x) = 5x^4 + 2x\cos(x^2) - \tfrac{1}{x}e^x - \ln(x)e^x$$

Question #4. (20 points). Four cars travel at different speeds:

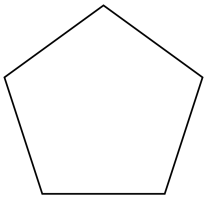
- The red car travels 191 miles in 90 minutes.
- The blue car travels 230 miles in 52 minutes.
- The yellow car travels 42 miles in 94 minutes.
- The green car travels 188 miles in 73 minutes.

Which car travels the fastest?

Answer.
The fastest car is the blue car.

Question #5. (10 points). In the following table of polygons, one is missing. Which is it?

Answer.

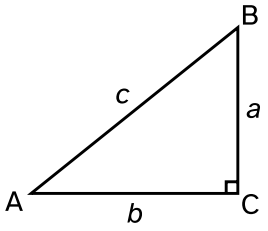


	Instituto Politénico Nacional		
	Unidad Profesional Interdisciplinaria de Ingeniería Campus Guanajuato		
	Subject Vectorial Calculus	**1st Partial Exam**	
Academy	Mathematics	**Date**	06/01/25
Teacher	Oswaldo Arias Estrada	**Class**	1AV1
Student		**Student ID**	
Exam ID	129302183-1-1	**Score**	/100

Instructions.

- Answer the following questions.
- You have 1 hour to complete the exam.
- Write your answers on the exam paper.

Question #1. (20 points). Solve for c, with $a = 87$ and $b = 4$.



Answer.

$$\begin{aligned} c &= \sqrt{a^2 + b^2} \\ &= \sqrt{87^2 + 4^2} \\ &= \sqrt{7569 + 16} \\ &= \sqrt{7585} \\ &\approx 87.0919 \end{aligned}$$

Question #2. (15 points). A bag has 89 blue balls, 32 yellow balls, and 26 red balls. How many random balls must be drawn from the bag to ensure that at least one blue ball is drawn?

Answer.
To ensure that at least one blue ball is drawn, we must draw at least 59 balls.

Question #3. (35 points). For the function:

$$f(x) = x^6 + \sin(x^2) - \ln(x)e^x + 17$$

find the derivative.

Answer.

$$f'(x) = 6x^5 + 2x\cos(x^2) - \tfrac{1}{x}e^x - \ln(x)e^x$$

Question #4. (20 points). Four cars travel at different speeds:

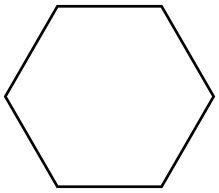
- The red car travels 264 miles in 61 minutes.
- The blue car travels 24 miles in 24 minutes.
- The yellow car travels 166 miles in 29 minutes.
- The green car travels 57 miles in 75 minutes.

Which car travels the fastest?

Answer.
The fastest car is the yellow car.

Question #5. (10 points). In the following table of polygons, one is missing. Which is it?

Answer.

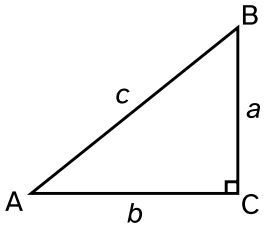


	Instituto Politénico Nacional		
	Unidad Profesional Interdisciplinaria de Ingeniería Campus Guanajuato		
	Subject Vectorial Calculus	**1st Partial Exam**	
Academy	Mathematics	**Date**	06/01/25
Teacher	Oswaldo Arias Estrada	**Class**	1AV1
Student		**Student ID**	
Exam ID	129302183-2-2	**Score**	/100

Instructions.

- Answer the following questions.
- You have 1 hour to complete the exam.
- Write your answers on the exam paper.

Question #1. (20 points). Solve for c, with $a = 37$ and $b = 59$.



Answer.

$$\begin{aligned} c &= \sqrt{a^2 + b^2} \\ &= \sqrt{37^2 + 59^2} \\ &= \sqrt{1369 + 3481} \\ &= \sqrt{4850} \\ &\approx 69.6419 \end{aligned}$$

Question #2. (15 points). A bag has 49 blue balls, 71 yellow balls, and 47 red balls. How many random balls must be drawn from the bag to ensure that at least one red ball is drawn?

Answer.
To ensure that at least one red ball is drawn, we must draw at least 121 balls.

Question #3. (35 points). For the function:

$$f(x) = x^3 + \sin(x^2) - \ln(x)e^x + 65$$

find the derivative.

Answer.

$$f'(x) = 3x^2 + 2x\cos(x^2) - \tfrac{1}{x}e^x - \ln(x)e^x$$

Question #4. (20 points). Four cars travel at different speeds:

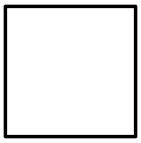
- The red car travels 119 miles in 46 minutes.
- The blue car travels 183 miles in 47 minutes.
- The yellow car travels 283 miles in 62 minutes.
- The green car travels 209 miles in 52 minutes.

Which car travels the fastest?

Answer.
The fastest car is the yellow car.

Question #5. (10 points). In the following table of polygons, one is missing. Which is it?

Answer.

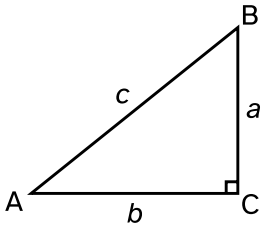


	Instituto Politénico Nacional		
	Unidad Profesional Interdisciplinaria de Ingeniería Campus Guanajuato		
	Subject Vectorial Calculus	**1st Partial Exam**	
Academy	Mathematics	**Date**	06/01/25
Teacher	Oswaldo Arias Estrada	**Class**	1AV1
Student		**Student ID**	
Exam ID	129302183-3-3	**Score**	/100

Instructions.

- Answer the following questions.
- You have 1 hour to complete the exam.
- Write your answers on the exam paper.

Question #1. (20 points). Solve for c, with $a = 5$ and $b = 15$.



Answer.

$$\begin{aligned} c &= \sqrt{a^2 + b^2} \\ &= \sqrt{5^2 + 15^2} \\ &= \sqrt{25 + 225} \\ &= \sqrt{250} \\ &\approx 15.8114 \end{aligned}$$

Question #2. (15 points). A bag has 23 blue balls, 40 yellow balls, and 43 red balls. How many random balls must be drawn from the bag to ensure that at least one blue ball is drawn?

Answer.
To ensure that at least one blue ball is drawn, we must draw at least 84 balls.

Question #3. (35 points). For the function:

$$f(x) = x^2 + \sin(x^2) - \ln(x)e^x + 27$$

find the derivative.

Answer.

$$f'(x) = 2x^1 + 2x\cos(x^2) - \tfrac{1}{x}e^x - \ln(x)e^x$$

Question #4. (20 points). Four cars travel at different speeds:

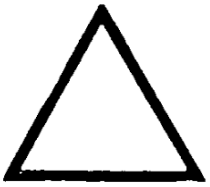
- The red car travels 26 miles in 85 minutes.
- The blue car travels 57 miles in 64 minutes.
- The yellow car travels 262 miles in 93 minutes.
- The green car travels 85 miles in 51 minutes.

Which car travels the fastest?

Answer.
The fastest car is the yellow car.

Question #5. (10 points). In the following table of polygons, one is missing. Which is it?

Answer.

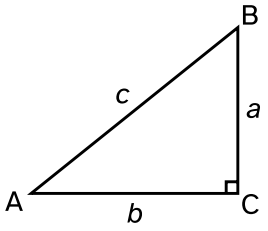


	Instituto Politénico Nacional		
	Unidad Profesional Interdisciplinaria de Ingeniería Campus Guanajuato		
	Subject Vectorial Calculus	**1st Partial Exam**	
Academy	Mathematics	**Date**	06/01/25
Teacher	Oswaldo Arias Estrada	**Class**	1AV1
Student		**Student ID**	
Exam ID	129302183-0-4	**Score**	/100

Instructions.

- Answer the following questions.
- You have 1 hour to complete the exam.
- Write your answers on the exam paper.

Question #1. (20 points). Solve for c, with $a = 62$ and $b = 75$.



Answer.

$$\begin{aligned} c &= \sqrt{a^2 + b^2} \\ &= \sqrt{62^2 + 75^2} \\ &= \sqrt{3844 + 5625} \\ &= \sqrt{9469} \\ &\approx 97.3088 \end{aligned}$$

Question #2. (15 points). A bag has 69 blue balls, 83 yellow balls, and 5 red balls. How many random balls must be drawn from the bag to ensure that at least one yellow ball is drawn?

Answer.
To ensure that at least one yellow ball is drawn, we must draw at least 75 balls.

Question #3. (35 points). For the function:

$$f(x) = x^5 + \sin(x^2) - \ln(x)e^x + 79$$

find the derivative.

Answer.

$$f'(x) = 5x^4 + 2x\cos(x^2) - \tfrac{1}{x}e^x - \ln(x)e^x$$

Question #4. (20 points). Four cars travel at different speeds:

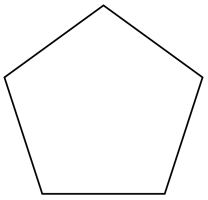
- The red car travels 191 miles in 90 minutes.
- The blue car travels 230 miles in 52 minutes.
- The yellow car travels 42 miles in 94 minutes.
- The green car travels 188 miles in 73 minutes.

Which car travels the fastest?

Answer.
The fastest car is the blue car.

Question #5. (10 points). In the following table of polygons, one is missing. Which is it?

Answer.

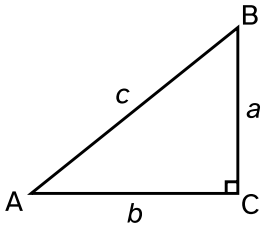


	Instituto Politénico Nacional		
	Unidad Profesional Interdisciplinaria de Ingeniería Campus Guanajuato		
	Subject Vectorial Calculus	**1st Partial Exam**	
Academy	Mathematics	**Date**	06/01/25
Teacher	Oswaldo Arias Estrada	**Class**	1AV1
Student		**Student ID**	
Exam ID	129302183-1-5	**Score**	/100

Instructions.

- Answer the following questions.
- You have 1 hour to complete the exam.
- Write your answers on the exam paper.

Question #1. (20 points). Solve for c, with $a = 87$ and $b = 4$.



Answer.

$$\begin{aligned} c &= \sqrt{a^2 + b^2} \\ &= \sqrt{87^2 + 4^2} \\ &= \sqrt{7569 + 16} \\ &= \sqrt{7585} \\ &\approx 87.0919 \end{aligned}$$

Question #2. (15 points). A bag has 89 blue balls, 32 yellow balls, and 26 red balls. How many random balls must be drawn from the bag to ensure that at least one blue ball is drawn?

Answer.
To ensure that at least one blue ball is drawn, we must draw at least 59 balls.

Question #3. (35 points). For the function:

$$f(x) = x^6 + \sin(x^2) - \ln(x)e^x + 17$$

find the derivative.

Answer.

$$f'(x) = 6x^5 + 2x\cos(x^2) - \tfrac{1}{x}e^x - \ln(x)e^x$$

Question #4. (20 points). Four cars travel at different speeds:

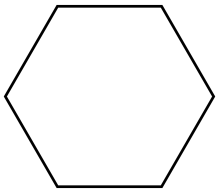
- The red car travels 264 miles in 61 minutes.
- The blue car travels 24 miles in 24 minutes.
- The yellow car travels 166 miles in 29 minutes.
- The green car travels 57 miles in 75 minutes.

Which car travels the fastest?

Answer.
The fastest car is the yellow car.

Question #5. (10 points). In the following table of polygons, one is missing. Which is it?

Answer.

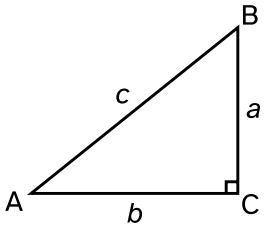


	Instituto Politénico Nacional		
	Unidad Profesional Interdisciplinaria de Ingeniería Campus Guanajuato		
	Subject Vectorial Calculus	**1st Partial Exam**	
Academy	Mathematics	**Date**	06/01/25
Teacher	Oswaldo Arias Estrada	**Class**	1AV1
Student		**Student ID**	
Exam ID	129302183-2-6	**Score**	/100

Instructions.

- Answer the following questions.
- You have 1 hour to complete the exam.
- Write your answers on the exam paper.

Question #1. (20 points). Solve for c, with $a = 37$ and $b = 59$.



Answer.

$$\begin{aligned} c &= \sqrt{a^2 + b^2} \\ &= \sqrt{37^2 + 59^2} \\ &= \sqrt{1369 + 3481} \\ &= \sqrt{4850} \\ &\approx 69.6419 \end{aligned}$$

Question #2. (15 points). A bag has 49 blue balls, 71 yellow balls, and 47 red balls. How many random balls must be drawn from the bag to ensure that at least one red ball is drawn?

Answer.
To ensure that at least one red ball is drawn, we must draw at least 121 balls.

Question #3. (35 points). For the function:

$$f(x) = x^3 + \sin(x^2) - \ln(x)e^x + 65$$

find the derivative.

Answer.

$$f'(x) = 3x^2 + 2x\cos(x^2) - \tfrac{1}{x}e^x - \ln(x)e^x$$

Question #4. (20 points). Four cars travel at different speeds:

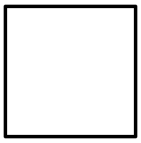
- The red car travels 119 miles in 46 minutes.
- The blue car travels 183 miles in 47 minutes.
- The yellow car travels 283 miles in 62 minutes.
- The green car travels 209 miles in 52 minutes.

Which car travels the fastest?

Answer.
The fastest car is the yellow car.

Question #5. (10 points). In the following table of polygons, one is missing. Which is it?

Answer.

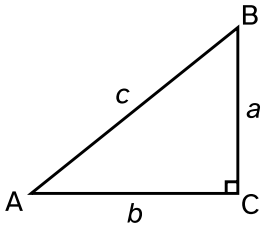


	Instituto Politénico Nacional		
	Unidad Profesional Interdisciplinaria de Ingeniería Campus Guanajuato		
	Subject Vectorial Calculus	**1st Partial Exam**	
Academy	Mathematics	**Date**	06/01/25
Teacher	Oswaldo Arias Estrada	**Class**	1AV1
Student		**Student ID**	
Exam ID	129302183-3-7	**Score**	/100

Instructions.

- Answer the following questions.
- You have 1 hour to complete the exam.
- Write your answers on the exam paper.

Question #1. (20 points). Solve for c, with $a = 5$ and $b = 15$.



Answer.

$$\begin{aligned} c &= \sqrt{a^2 + b^2} \\ &= \sqrt{5^2 + 15^2} \\ &= \sqrt{25 + 225} \\ &= \sqrt{250} \\ &\approx 15.8114 \end{aligned}$$

Question #2. (15 points). A bag has 23 blue balls, 40 yellow balls, and 43 red balls. How many random balls must be drawn from the bag to ensure that at least one blue ball is drawn?

Answer.
To ensure that at least one blue ball is drawn, we must draw at least 84 balls.

Question #3. (35 points). For the function:

$$f(x) = x^2 + \sin(x^2) - \ln(x)e^x + 27$$

find the derivative.

Answer.

$$f'(x) = 2x^1 + 2x\cos(x^2) - \tfrac{1}{x}e^x - \ln(x)e^x$$

Question #4. (20 points). Four cars travel at different speeds:

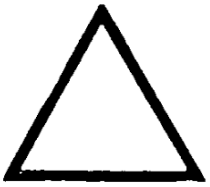
- The red car travels 26 miles in 85 minutes.
- The blue car travels 57 miles in 64 minutes.
- The yellow car travels 262 miles in 93 minutes.
- The green car travels 85 miles in 51 minutes.

Which car travels the fastest?

Answer.
The fastest car is the yellow car.

Question #5. (10 points). In the following table of polygons, one is missing. Which is it?

Answer.

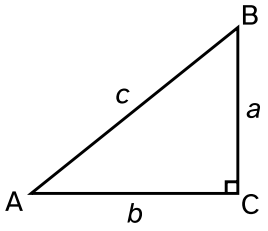


	Instituto Politénico Nacional		
	Unidad Profesional Interdisciplinaria de Ingeniería Campus Guanajuato		
	Subject Vectorial Calculus	**1st Partial Exam**	
Academy	Mathematics	**Date**	06/01/25
Teacher	Oswaldo Arias Estrada	**Class**	1AV1
Student		**Student ID**	
Exam ID	129302183-0-8	**Score**	/100

Instructions.

- Answer the following questions.
- You have 1 hour to complete the exam.
- Write your answers on the exam paper.

Question #1. (20 points). Solve for c, with $a = 62$ and $b = 75$.



Answer.

$$\begin{aligned} c &= \sqrt{a^2 + b^2} \\ &= \sqrt{62^2 + 75^2} \\ &= \sqrt{3844 + 5625} \\ &= \sqrt{9469} \\ &\approx 97.3088 \end{aligned}$$

Question #2. (15 points). A bag has 69 blue balls, 83 yellow balls, and 5 red balls. How many random balls must be drawn from the bag to ensure that at least one yellow ball is drawn?

Answer.
To ensure that at least one yellow ball is drawn, we must draw at least 75 balls.

Question #3. (35 points). For the function:

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find the derivative.

Answer.

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Question #4. (20 points). Four cars travel at different speeds:

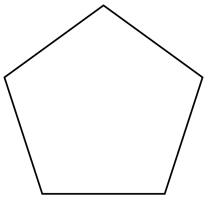
- The red car travels 191 miles in 90 minutes.
- The blue car travels 230 miles in 52 minutes.
- The yellow car travels 42 miles in 94 minutes.
- The green car travels 188 miles in 73 minutes.

Which car travels the fastest?

Answer.
The fastest car is the blue car.

Question #5. (10 points). In the following table of polygons, one is missing. Which is it?

Answer.

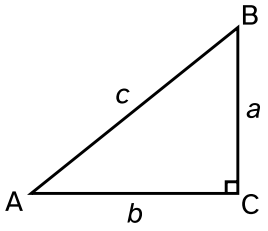


	Instituto Politénico Nacional		
	Unidad Profesional Interdisciplinaria de Ingeniería Campus Guanajuato		
	Subject Vectorial Calculus	**1st Partial Exam**	
Academy	Mathematics	**Date**	06/01/25
Teacher	Oswaldo Arias Estrada	**Class**	1AV1
Student		**Student ID**	
Exam ID	129302183-1-9	**Score**	/100

Instructions.

- Answer the following questions.
- You have 1 hour to complete the exam.
- Write your answers on the exam paper.

Question #1. (20 points). Solve for c, with $a = 87$ and $b = 4$.



Answer.

$$\begin{aligned} c &= \sqrt{a^2 + b^2} \\ &= \sqrt{87^2 + 4^2} \\ &= \sqrt{7569 + 16} \\ &= \sqrt{7585} \\ &\approx 87.0919 \end{aligned}$$

Question #2. (15 points). A bag has 89 blue balls, 32 yellow balls, and 26 red balls. How many random balls must be drawn from the bag to ensure that at least one blue ball is drawn?

Answer.
To ensure that at least one blue ball is drawn, we must draw at least 59 balls.

Question #3. (35 points). For the function:

$$f(x) = x^6 + \sin(x^2) - \ln(x)e^x + 17$$

find the derivative.

Answer.

$$f'(x) = 6x^5 + 2x\cos(x^2) - \tfrac{1}{x}e^x - \ln(x)e^x$$

Question #4. (20 points). Four cars travel at different speeds:

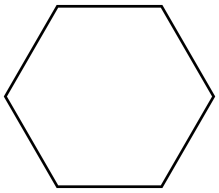
- The red car travels 264 miles in 61 minutes.
- The blue car travels 24 miles in 24 minutes.
- The yellow car travels 166 miles in 29 minutes.
- The green car travels 57 miles in 75 minutes.

Which car travels the fastest?

Answer.
The fastest car is the yellow car.

Question #5. (10 points). In the following table of polygons, one is missing. Which is it?

Answer.

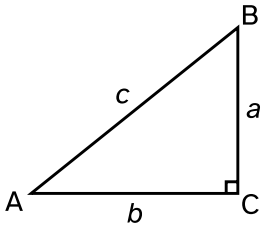


	Instituto Politénico Nacional		
	Unidad Profesional Interdisciplinaria de Ingeniería Campus Guanajuato		
	Subject Vectorial Calculus	**1st Partial Exam**	
Academy	Mathematics	**Date**	06/01/25
Teacher	Oswaldo Arias Estrada	**Class**	1AV1
Student		**Student ID**	
Exam ID	129302183-2-10	**Score**	/100

Instructions.

- Answer the following questions.
- You have 1 hour to complete the exam.
- Write your answers on the exam paper.

Question #1. (20 points). Solve for c, with $a = 37$ and $b = 59$.



Answer.

$$\begin{aligned} c &= \sqrt{a^2 + b^2} \\ &= \sqrt{37^2 + 59^2} \\ &= \sqrt{1369 + 3481} \\ &= \sqrt{4850} \\ &\approx 69.6419 \end{aligned}$$

Question #2. (15 points). A bag has 49 blue balls, 71 yellow balls, and 47 red balls. How many random balls must be drawn from the bag to ensure that at least one red ball is drawn?

Answer.
To ensure that at least one red ball is drawn, we must draw at least 121 balls.

Question #3. (35 points). For the function:

$$f(x) = x^3 + \sin(x^2) - \ln(x)e^x + 65$$

find the derivative.

Answer.

$$f'(x) = 3x^2 + 2x\cos(x^2) - \tfrac{1}{x}e^x - \ln(x)e^x$$

Question #4. (20 points). Four cars travel at different speeds:

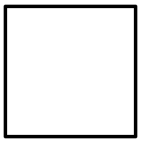
- The red car travels 119 miles in 46 minutes.
- The blue car travels 183 miles in 47 minutes.
- The yellow car travels 283 miles in 62 minutes.
- The green car travels 209 miles in 52 minutes.

Which car travels the fastest?

Answer.
The fastest car is the yellow car.

Question #5. (10 points). In the following table of polygons, one is missing. Which is it?

Answer.



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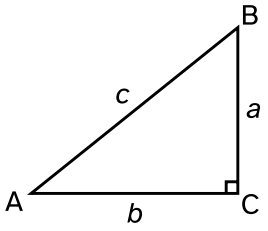
Teacher	Oswaldo Arias Estrada	**Class**	1AV1
Student		**Student ID**	
Exam ID	129302183-3-11	**Score**	/100

Instructions.

- Answer the following questions.
- You have 1 hour to complete the exam.
- Write your answers on the exam paper.

Question #1. (20 points). Solve for c, with $a = 5$ and $b = 15$.



Answer.

$$\begin{aligned} c &= \sqrt{a^2 + b^2} \\ &= \sqrt{5^2 + 15^2} \\ &= \sqrt{25 + 225} \\ &= \sqrt{250} \\ &\approx 15.8114 \end{aligned}$$

Question #2. (15 points). A bag has 23 blue balls, 40 yellow balls, and 43 red balls. How many random balls must be drawn from the bag to ensure that at least one blue ball is drawn?

Answer.
To ensure that at least one blue ball is drawn, we must draw at least 84 balls.

Question #3. (35 points). For the function:

$$f(x) = x^2 + \sin(x^2) - \ln(x)e^x + 27$$

find the derivative.

Answer.

$$f'(x) = 2x^1 + 2x\cos(x^2) - \tfrac{1}{x}e^x - \ln(x)e^x$$

Question #4. (20 points). Four cars travel at different speeds:

- The red car travels 26 miles in 85 minutes.
- The blue car travels 57 miles in 64 minutes.
- The yellow car travels 262 miles in 93 minutes.
- The green car travels 85 miles in 51 minutes.

Which car travels the fastest?

Answer.
The fastest car is the yellow car.

Question #5. (10 points). In the following table of polygons, one is missing. Which is it?

Answer.