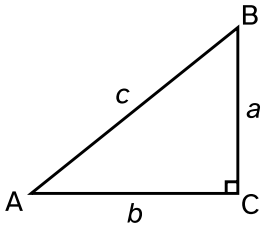
	Instituto Politénico Nacional		
	Unidad Profesional Interdisciplinaria de Ingeniería Campus Guanajuato		
	Subject Vectorial Calculus	**1st Partial Exam**	
Academy	Mathematics	**Date**	06/01/25
Teacher	Oswaldo Arias Estrada	**Class**	1AV1
Student		**Student ID**	
Exam ID	129302183-0-0	**Score**	/100

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:

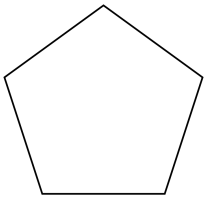
- The red car travels 191 miles in 90 minutes.
- The blue car travels 230 miles in 52 minutes.
- The yellow car travels 42 miles in 94 minutes.
- The green car travels 188 miles in 73 minutes.

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.

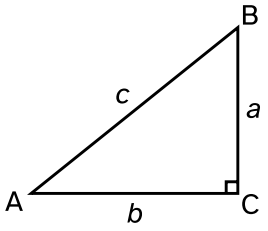


	Instituto Politénico Nacional		
	Unidad Profesional Interdisciplinaria de Ingeniería Campus Guanajuato		
	Subject Vectorial Calculus	**1st Partial Exam**	
Academy	Mathematics	**Date**	06/01/25
Teacher	Oswaldo Arias Estrada	**Class**	1AV1
Student		**Student ID**	
Exam ID	129302183-1-1	**Score**	/100

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:

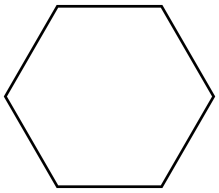
- The red car travels 264 miles in 61 minutes.
- The blue car travels 24 miles in 24 minutes.
- The yellow car travels 166 miles in 29 minutes.
- The green car travels 57 miles in 75 minutes.

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		
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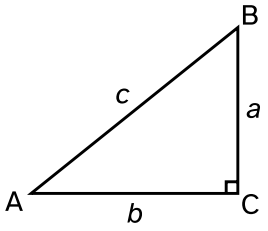
	Subject Vectorial Calculus	**1st Partial Exam**	
Academy	Mathematics	**Date**	06/01/25
Teacher	Oswaldo Arias Estrada	**Class**	1AV1
Student		**Student ID**	
Exam ID	129302183-2-2	**Score**	/100

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:

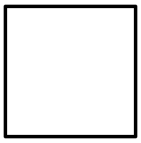
- The red car travels 119 miles in 46 minutes.
- The blue car travels 183 miles in 47 minutes.
- The yellow car travels 283 miles in 62 minutes.
- The green car travels 209 miles in 52 minutes.

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		
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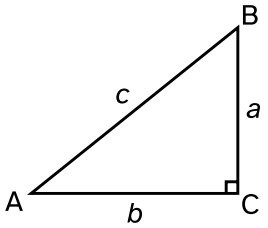
	Subject Vectorial Calculus	**1st Partial Exam**	
Academy	Mathematics	**Date**	06/01/25
Teacher	Oswaldo Arias Estrada	**Class**	1AV1
Student		**Student ID**	
Exam ID	129302183-3-3	**Score**	/100

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:

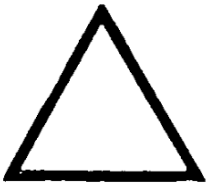
- The red car travels 26 miles in 85 minutes.
- The blue car travels 57 miles in 64 minutes.
- The yellow car travels 262 miles in 93 minutes.
- The green car travels 85 miles in 51 minutes.

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.



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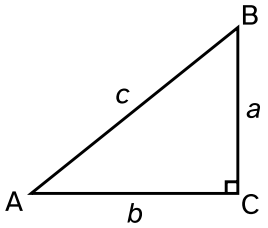
	Unidad Profesional Interdisciplinaria de Ingeniería Campus Guanajuato		
	Subject Vectorial Calculus	**1st Partial Exam**	
Academy	Mathematics	**Date**	06/01/25
Teacher	Oswaldo Arias Estrada	**Class**	1AV1
Student		**Student ID**	
Exam ID	129302183-4-4	**Score**	/100

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 $a = 52$ and $b = 23$.



Answer.

$$\begin{aligned} c &= \sqrt{a^2 + b^2} \\ &= \sqrt{52^2 + 23^2} \\ &= \sqrt{2704 + 529} \\ &= \sqrt{3233} \\ &\approx 56.8595 \end{aligned}$$

Question #2. (15 points). A bag has 61 blue balls, 46 yellow balls, and 42 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 89 balls.

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

$$f(x) = x^4 + \sin(x^2) - \ln(x)e^x + 34$$

find the derivative.

Answer.

$$f'(x) = 4x^3 + 2x\cos(x^2) - \tfrac{1}{x}e^x - \ln(x)e^x$$

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

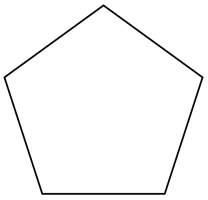
- The red car travels 163 miles in 56 minutes.
- The blue car travels 80 miles in 77 minutes.
- The yellow car travels 259 miles in 92 minutes.
- The green car travels 21 miles in 36 minutes.

Which car travels the fastest?

Answer.
The fastest car is the red car.

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

Answer.



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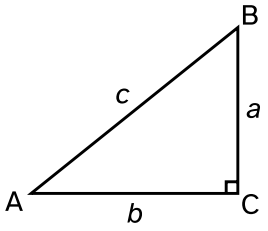
	Unidad Profesional Interdisciplinaria de Ingeniería Campus Guanajuato		
	Subject Vectorial Calculus	**1st Partial Exam**	
Academy	Mathematics	**Date**	06/01/25
Teacher	Oswaldo Arias Estrada	**Class**	1AV1
Student		**Student ID**	
Exam ID	129302183-5-5	**Score**	/100

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 $a = 2$ and $b = 70$.



Answer.

$$\begin{aligned} c &= \sqrt{a^2 + b^2} \\ &= \sqrt{2^2 + 70^2} \\ &= \sqrt{4 + 4900} \\ &= \sqrt{4904} \\ &\approx 70.0286 \end{aligned}$$

Question #2. (15 points). A bag has 21 blue balls, 78 yellow balls, and 34 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 100 balls.

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

$$f(x) = x^2 + \sin(x^2) - \ln(x)e^x + 74$$

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:

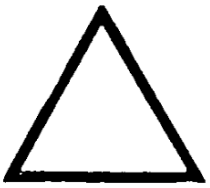
- The red car travels 19 miles in 93 minutes.
- The blue car travels 214 miles in 98 minutes.
- The yellow car travels 210 miles in 41 minutes.
- The green car travels 284 miles in 45 minutes.

Which car travels the fastest?

Answer.
The fastest car is the green car.

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

Answer.



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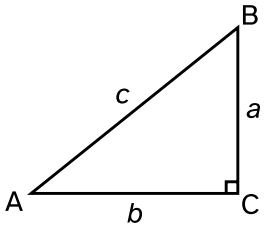
	Unidad Profesional Interdisciplinaria de Ingeniería Campus Guanajuato		
	Subject Vectorial Calculus	**1st Partial Exam**	
Academy	Mathematics	**Date**	06/01/25
Teacher	Oswaldo Arias Estrada	**Class**	1AV1
Student		**Student ID**	
Exam ID	129302183-6-6	**Score**	/100

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 $a = 31$ and $b = 26$.



Answer.

$$\begin{aligned} c &= \sqrt{a^2 + b^2} \\ &= \sqrt{31^2 + 26^2} \\ &= \sqrt{961 + 676} \\ &= \sqrt{1637} \\ &\approx 40.4599 \end{aligned}$$

Question #2. (15 points). A bag has 44 blue balls, 47 yellow balls, and 49 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 92 balls.

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

$$f(x) = x^3 + \sin(x^2) - \ln(x)e^x + 36$$

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:

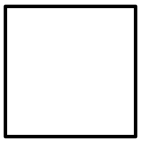
- The red car travels 103 miles in 42 minutes.
- The blue car travels 87 miles in 82 minutes.
- The yellow car travels 299 miles in 39 minutes.
- The green car travels 280 miles in 88 minutes.

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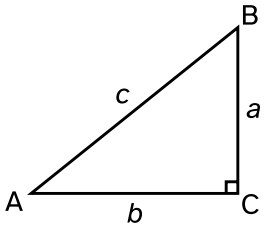
	Unidad Profesional Interdisciplinaria de Ingeniería Campus Guanajuato		
	Subject Vectorial Calculus	**1st Partial Exam**	
Academy	Mathematics	**Date**	06/01/25
Teacher	Oswaldo Arias Estrada	**Class**	1AV1
Student		**Student ID**	
Exam ID	129302183-7-7	**Score**	/100

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 $a = 65$ and $b = 31$.



Answer.

$$\begin{aligned} c &= \sqrt{a^2 + b^2} \\ &= \sqrt{65^2 + 31^2} \\ &= \sqrt{4225 + 961} \\ &= \sqrt{5186} \\ &\approx 72.0139 \end{aligned}$$

Question #2. (15 points). A bag has 72 blue balls, 51 yellow balls, and 33 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 85 balls.

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

$$f(x) = x^5 + \sin(x^2) - \ln(x)e^x + 40$$

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:

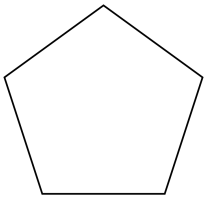
- The red car travels 200 miles in 63 minutes.
- The blue car travels 101 miles in 32 minutes.
- The yellow car travels 202 miles in 65 minutes.
- The green car travels 64 miles in 17 minutes.

Which car travels the fastest?

Answer.
The fastest car is the green car.

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

Answer.

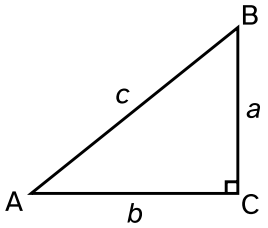


	Instituto Politénico Nacional		
	Unidad Profesional Interdisciplinaria de Ingeniería Campus Guanajuato		
	Subject Vectorial Calculus	**1st Partial Exam**	
Academy	Mathematics	**Date**	06/01/25
Teacher	Oswaldo Arias Estrada	**Class**	1AV1
Student		**Student ID**	
Exam ID	129302183-8-8	**Score**	/100

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 $a = 84$ and $b = 27$.



Answer.

$$\begin{aligned} c &= \sqrt{a^2 + b^2} \\ &= \sqrt{84^2 + 27^2} \\ &= \sqrt{7056 + 729} \\ &= \sqrt{7785} \\ &\approx 88.2326 \end{aligned}$$

Question #2. (15 points). A bag has 87 blue balls, 48 yellow balls, and 47 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 135 balls.

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

$$f(x) = x^6 + \sin(x^2) - \ln(x)e^x + 37$$

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:

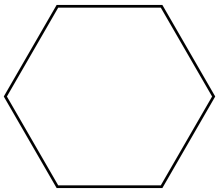
- The red car travels 255 miles in 75 minutes.
- The blue car travels 91 miles in 76 minutes.
- The yellow car travels 288 miles in 37 minutes.
- The green car travels 114 miles in 32 minutes.

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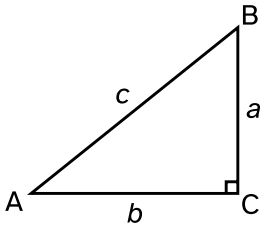
	Unidad Profesional Interdisciplinaria de Ingeniería Campus Guanajuato		
	Subject Vectorial Calculus	**1st Partial Exam**	
Academy	Mathematics	**Date**	06/01/25
Teacher	Oswaldo Arias Estrada	**Class**	1AV1
Student		**Student ID**	
Exam ID	129302183-9-9	**Score**	/100

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 $a = 84$ and $b = 91$.



Answer.

$$\begin{aligned} c &= \sqrt{a^2 + b^2} \\ &= \sqrt{84^2 + 91^2} \\ &= \sqrt{7056 + 8281} \\ &= \sqrt{15337} \\ &\approx 123.8426 \end{aligned}$$

Question #2. (15 points). A bag has 87 blue balls, 93 yellow balls, and 27 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 121 balls.

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

$$f(x) = x^6 + \sin(x^2) - \ln(x)e^x + 92$$

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:

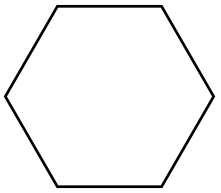
- The red car travels 254 miles in 53 minutes.
- The blue car travels 275 miles in 50 minutes.
- The yellow car travels 169 miles in 53 minutes.
- The green car travels 94 miles in 87 minutes.

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.



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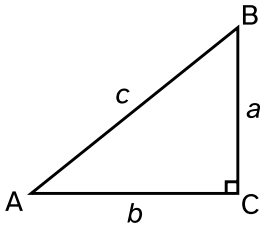
	Unidad Profesional Interdisciplinaria de Ingeniería Campus Guanajuato		
	Subject Vectorial Calculus	**1st Partial Exam**	
Academy	Mathematics	**Date**	06/01/25
Teacher	Oswaldo Arias Estrada	**Class**	1AV1
Student		**Student ID**	
Exam ID	129302183-10-10	**Score**	/100

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 $a = 92$ and $b = 78$.



Answer.

$$\begin{aligned} c &= \sqrt{a^2 + b^2} \\ &= \sqrt{92^2 + 78^2} \\ &= \sqrt{8464 + 6084} \\ &= \sqrt{14548} \\ &\approx 120.6151 \end{aligned}$$

Question #2. (15 points). A bag has 94 blue balls, 85 yellow balls, and 19 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 114 balls.

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

$$f(x) = x^6 + \sin(x^2) - \ln(x)e^x + 81$$

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:

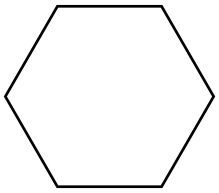
- The red car travels 279 miles in 38 minutes.
- The blue car travels 239 miles in 27 minutes.
- The yellow car travels 124 miles in 25 minutes.
- The green car travels 145 miles in 29 minutes.

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.

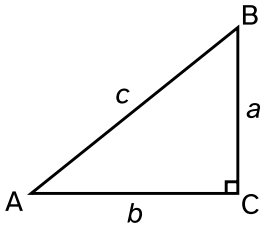


	Instituto Politénico Nacional		
	Unidad Profesional Interdisciplinaria de Ingeniería Campus Guanajuato		
	Subject Vectorial Calculus	**1st Partial Exam**	
Academy	Mathematics	**Date**	06/01/25
Teacher	Oswaldo Arias Estrada	**Class**	1AV1
Student		**Student ID**	
Exam ID	129302183-11-11	**Score**	/100

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 $a = 54$ and $b = 86$.



Answer.

$$\begin{aligned} c &= \sqrt{a^2 + b^2} \\ &= \sqrt{54^2 + 86^2} \\ &= \sqrt{2916 + 7396} \\ &= \sqrt{10312} \\ &\approx 101.548 \end{aligned}$$

Question #2. (15 points). A bag has 62 blue balls, 90 yellow balls, and 2 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 65 balls.

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

$$f(x) = x^4 + \sin(x^2) - \ln(x)e^x + 88$$

find the derivative.

Answer.

$$f'(x) = 4x^3 + 2x\cos(x^2) - \tfrac{1}{x}e^x - \ln(x)e^x$$

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

- The red car travels 167 miles in 17 minutes.
- The blue car travels 261 miles in 70 minutes.
- The yellow car travels 25 miles in 22 minutes.
- The green car travels 113 miles in 36 minutes.

Which car travels the fastest?

Answer.
The fastest car is the red car.

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

Answer.