


## PLATON IB DIPLOMA EXAMINATIONS ACADEMIC YEAR 2021-22

<b>Date of examination:</b>		
<b>Student name:</b>	<b>Year: DP1</b>	
<b>Subject &amp; Level: Placement test</b>	<b>Exam Paper: Paper 1</b>	
<b>Exam Paper's duration: 1 hour 15 minutes (63 marks)</b>		
<b>Type of examination:</b>	<b>Mid-year Exams</b>	<b>Placement test</b> 
	<b>September Evaluative Exams</b>	<b>Mock Exams</b>
<b>Supporting equipment/materials needed - additional instructions:</b> <b>Formula Booklet</b>		

1. [Maximum marks 6]

Consider the following sequence of figures.

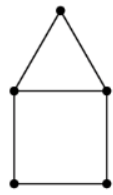


Figure 1

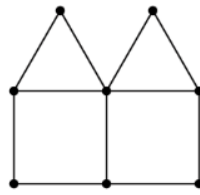


Figure 2

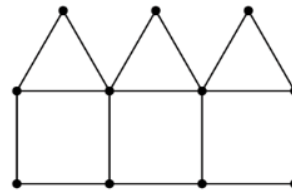


Figure 3

Figure 1 contains 6 line segments.

(a) Given that Figure  $n$  contains 101 line segments, show that  $n = 20$ .

[3]

(b) Find the total number of line segments in the first 20 figures.

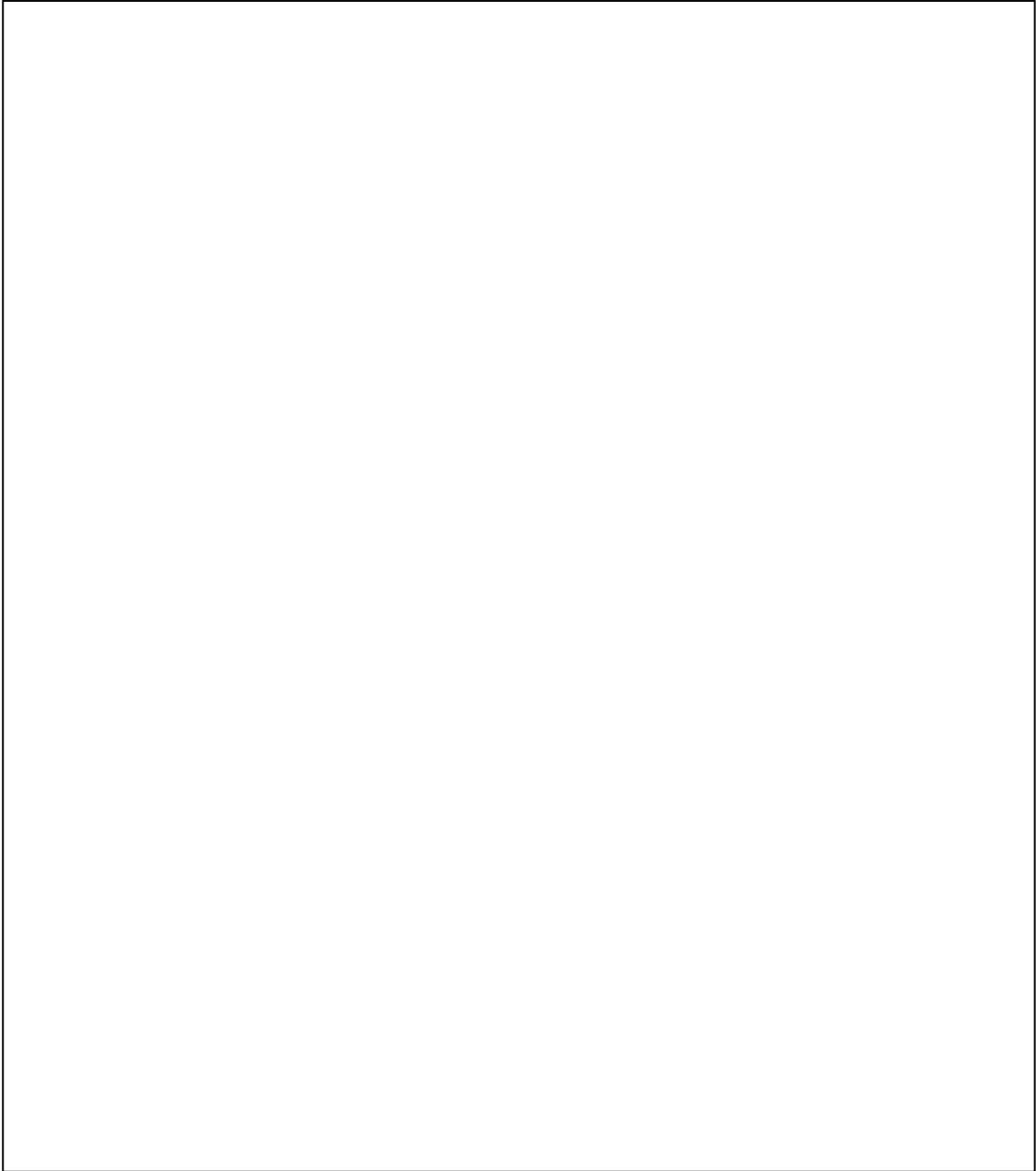
[3]

Empty box for student response.

2. [Maximum marks 5]

Solve the following system of linear equations:

$$\begin{cases} 5x + 3y = 29 \\ 4x + 6y = 34 \end{cases}$$



3. [ Maximum marks:8]

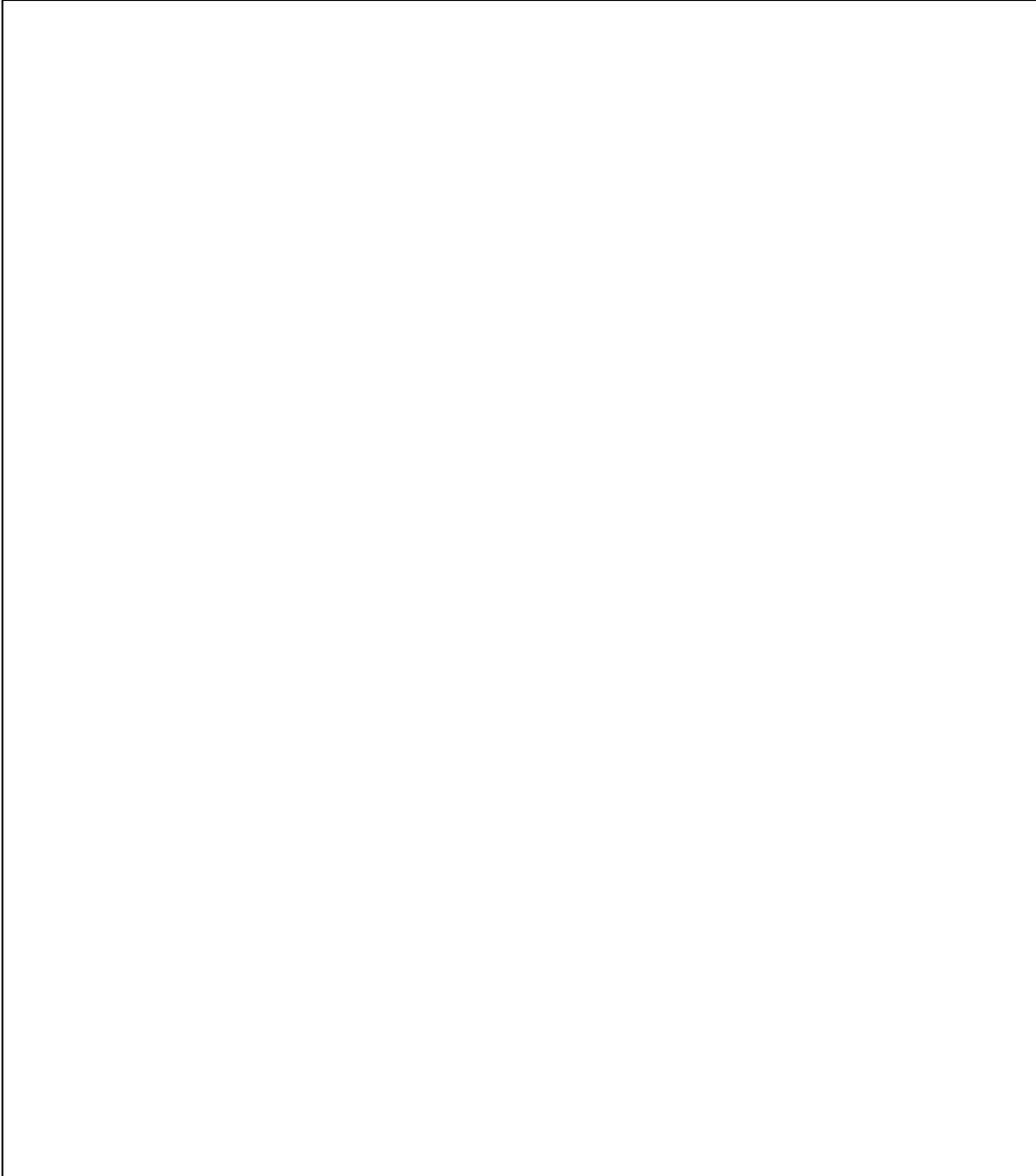
Factorize completely the following expressions:

i.  $x^2y + 3xy + 2xy^2$

ii.  $(2x + 3y)^2 - (4x + 5y)^2$

iii.  $4x^2 - 5x + 1$

iv.  $12a^2b + 4ab - 8ab^2$



4. [Maximum marks:6]

Solve the inequality  $2x^2 + 3x - 1 > 0$ .

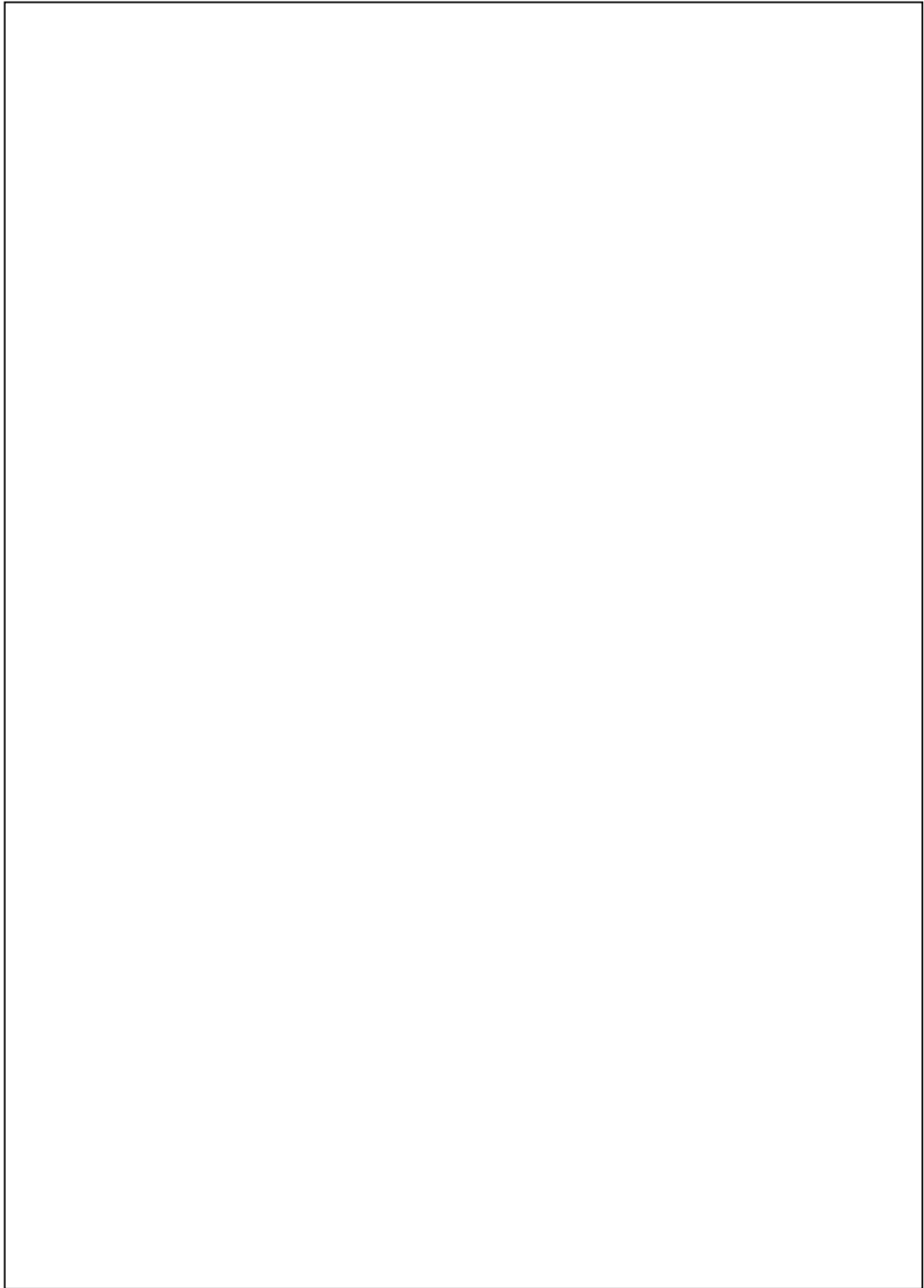
5. [Maximum marks:6]

Given that  $a = \frac{3}{1-\sqrt{5}}$  and  $\beta = \frac{4}{1+\sqrt{5}}$ . Find  $a^2 - \beta^2$ .

6. [Maximum marks:8]

i. Rationalize the fraction  $\frac{15}{\sqrt{5}-\sqrt{7}}$

ii. Simplify  $\frac{\sqrt{45}-2\sqrt{18}+3\sqrt{27}}{\sqrt{20}-2\sqrt{8}+3\sqrt{12}}$



7. [Maximum marks:10]

In an excursion there were 30 participants, men, women and children. Women were equal to 25% of men participants and children where 50% of the number of men and women together. Find how many were the men, the women and the children participating in the excursion.



8. [Maximum marks: 14]

a) Solve  $x^2 - 6x + 8 = 0$

b) Find the values of  $k$  in order for the equation  $2x^2 + (3 - k)x + k + 3 = 0$  to have no real roots.