Q1
5 Points

Consider the recursion relation

$$a_n = 9a_{n-1} - 20a_{n-2}$$

for n greater than or equal to 2, with the following initial conditions:

$$a_0 = 3$$

$$a_1 = 13$$

with initial conditions a_0 = 3 and a_1 = 13.

Q1.1 Recurrence Relation
1 Point

Find the roots of the auxiliary polynomial. Enter the smaller one in the following box.

4

Q1.2
1 Point

Now enter the larger of the two roots in the following box:

5

Q1.3
1 Point

Let r_1 denote the smaller of the two roots of the auxiliary polynomial and let r_2 denote the larger of the two roots.

We know from class that the solution to the recurrence relation subject to the initial conditions has the form c (r_1)^n + d (r_2)^n.

What is c?

2

Q1.4
1 Point

What is d?

1

Q1.5
1 Point

Use the formula you found for the solution to calculate a_5 (give a numerical answer).

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Q2 Graph
5 Points

Let G = (V,E) be a simple graph defined as follows: the vertex set V is the set {1,2,...,13}, and for any vertices v and w, there is an edge between v and w if and only if exactly one of v and w is even (and the other is odd).

Q2.1 Graph
2.5 Points

Is G bipartite?

- (●) Yes, it is bipartite
- ( ) No, it is not

Q2.2
2.5 Points

How many edges does G have?

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Quiz 5

GRADED

STUDENT
David Xiong

TOTAL POINTS
10 / 10 pts

QUESTION 1

(no title) **5** / 5 pts

1.1	Recurrence Relation	**1** / 1 pt
1.2	(no title)	**1** / 1 pt
1.3	(no title)	**1** / 1 pt
1.4	(no title)	**1** / 1 pt
1.5	(no title)	**1** / 1 pt

QUESTION 2

Graph **5** / 5 pts

2.1	Graph	**2.5** / 2.5 pts
2.2	(no title)	**2.5** / 2.5 pts