Quiz 3 F1009

No.: Date:

$6\frac{1}{2}$

Question 1

a) $(3n-2) = \frac{n(3n-1)}{2}$

$P(1): (3(1)-2) = \frac{1(3(1)-1)}{2}$

$1 = (3-2) = \frac{1(3-1)}{2}$

$1 = 1 = \frac{1(2)}{2}$

$2\frac{1}{2}$

$1 = 1 = \frac{\cancel{2}\,1}{\cancel{2}\,1}$

$1 = 1 = 1$ ∴ Both sides equal to 1.

b) $1+4+7+10+\ldots+(3n-2) = \frac{n(3n-1)}{2}$

$1+4+7+10+\ldots+(3k-2) = \frac{k(3k-1)}{2}$

$1+4+7+10+\ldots+(3k-2+1) = \frac{(k+1)(3k-1+1)}{2}$

$= 3k^2$

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Question 1

$f(n) + \frac{1}{2} f(n+1) = \frac{2}{f(n)} + 3f(n)$

$f(0) = 1$

~~$f(1+1) = \frac{2}{f(1+1)} + 3f($~~

$f(1) = \frac{2}{f(1-1)} + 3f(1-1)$

$= \frac{2}{f(0)} + 3f(0)$

$= \frac{2}{1} + 3(1)$

$= 2 + 3$

$= 5$

$f(1+1) = \frac{2}{f(2-1)} + 3f(2-1)$

$f(2) = \frac{2}{f(1)} + 3f(1)$

$= \frac{2}{5} + 3(5)$

$= 0.4 + 15$

$= 15.4$

$f(2+1) = \frac{2}{f(3-1)} + 3f(3-1)$

$f(3) = \frac{2}{f(2)} + 3f(2)$

$= \frac{2}{15.4} + 3(15.4)$

$= 0.129 + 46.2$

No.: Date:

$$f(3+1) = \frac{2}{f(4-1)} + 3f(4-1)$$

$$f(4) = \frac{2}{f(3)} + 3f(3)$$

$$= \frac{2}{46.329} + 3(46.329)$$

$$= 139.03$$

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KEMENTERIA PENDIDIKAN MALAYSIA POLITEKNIK MALAYSIA		COURSE CODE/ COURSE NAME		DBM2033 DISCRETE MATHEMATICS	
		COURSEWORK ASSESSMENT		QUIZ 3	
		SESSION		DECEMBER 2018	
JABATAN MATEMATIK, SAINS DAN KOMPUTER		DURATION	15 MINS	CLO1	10 MARKS
NAME	FREDERICK ZHARYLC			CLO2	$3\frac{1}{2}$
REGISTRATION NO.	05DDT18F1141			CLO3	
PROGRAMME/ SECTION	DDT2B	TOTAL MARKS		10 MARKS	

Instructions
- Answer ALL questions. Write your answers in the spaces provided.
- Show your working to get marks. You may use a non-programmable scientific calculator.

Question 1
CLO2, C3 [6 marks]

Let P(n) is the statement of $1+4+7+10+\cdots+(3n-2)=\frac{n(3n-1)}{2}$, where n is all positive integer.

(a) Show that P(1) is true.
(b) Complete the inductive step.

Question 2
CLO2, C2 [4 marks]

Suppose f is recursively defined by $f(0)=1$ and $f(n+1)=\frac{2}{f(n)}+3f(n)$.
Count $f(4)$.

Question 1

a) ~~Basis Step~~

$(3(1)-2) = \frac{1(3(1)-1)}{2}$

$(3-2) = \frac{3-1}{2}$

$1 = \frac{2}{2}$

$1 = 1$

$\therefore$ P(1) is true.

$2\frac{1}{2}$

b) $\frac{k(3k-1)}{2}$

$k(3k-1)$ divisible by 2

$k(3k-1) = 2x$

$3k^2 - k$

$3k^{2+1} - k^{1+1}$

$3k^2 . 3k^1 - k^1 . k^1$

$= (3k^2 - k)2$

Question 2

$$f(n+1) = \frac{2}{f(n)} + 3f(n)$$

$$f(0) = \frac{2}{0} + 3(0)$$

$$f(1) = \frac{2}{1} + 3(1)$$
$$= 2 + 3$$
$$= 5$$

$$f(2) = f(1+1) = \frac{2}{(2)} + 3(2)$$
$$= 1 + 6$$
$$= 7$$

$$f(3) = f(2+1) = \frac{2}{3} + 3(3)$$
$$= 0.7 +$$

$$f(0) = \frac{2}{0} + 3(0)$$
$$= 0$$

$$f(1) = f(0+1) = \frac{2}{1} + 3(1)$$
$$= 2 + 3$$
$$= 5$$

1

$$f(2) = f(1+1) = \frac{2}{2} + 3(2)$$
$$= 1 + 6$$
$$= 7$$

$$f(3) = f(2+1) = \frac{2}{3} + 3(3)$$
$$= 0.7 + 9$$
$$= 10$$

$$f(4) = f(3+1) = \frac{2}{4} + 3(4)$$
$$= 0.5 + 12$$
$$= 13$$

F1096

No.
Date : 6/3/19.

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Question 1

$P(1) = (3(1) - 2) = \frac{3(3(1)-1)}{2}$

$= 1 = 1$

Both side equal to 1

b) complet the inductive step.

$(3(k)-2) + (k+1)3$

$= \frac{k(3(k-1) + 2(k+1)^3}{2}$

$= \frac{(3k-1)[k+2(k+1)]}{2}$

$= \frac{(3k-1)(k+2k+1)}{2}$

$= \frac{(3k-1)(3k+1)}{2}$

4

Question 2.

$f(0)=1$

$$f(n+1)=\frac{2}{f(n)}+3f(n)$$

$$f(1)=f(0+1)=\frac{2}{f(0)}+3f(0)$$

$$=\frac{2}{1}+3(1)$$

$$=5$$

$$f(2)=f(1+1)=\frac{2}{f(1)}+3f(1)$$

$$=\frac{2}{5}+3(5)$$

$$=15.4$$

4

$$f(3)=f(2+1)=\frac{2}{f(2)}+3f(2)$$

$$=\frac{2}{15.4}+3(15.4)$$

$$=46.33$$

$$f(4)=f(3+1)=\frac{2}{f(3)}+3(f(3))$$

$$=\frac{2}{46.33}+3(46.33)$$

$$=139.03$$

FINA FAZIRA BINTI FAIZAL
05DDT18F1989

Subject: DISCRETE MATHEMATICS

No: WEDNESDAY

Date: 06 . 03 . 2019

F1989

14

QUIZ 3

QUESTION 1

a) $P(1) : (3(1) - 2) = \frac{1(3(1)-1)}{2} = \frac{1(2)}{2} = 1$

1 = both sides equal to 1.

2/4

b) Inductive step

$1 + 4 + 7 + 10 + \dots + (3n-2) = \frac{n(3n-1)}{2}$

$= \frac{k^2(k+1)^2 + 4(3k-1)}{2}$

$= \frac{(k+1)^2[k^2 + 1(3k-1)]}{2}$

$= \frac{(k+1)^2(k^2+3k)}{2}$

X 10 pencil

1/2 no pen

Question 2

$f(0) = 1$ and $f(n+1) = \frac{2}{f(n)} + 3f(n)$, count $f(4)$

$f(1) = f(0+1) = \frac{2}{f(1)} + 3f(1) = 5$

$f(2) = f(1+1) = \frac{2}{f(2)} + 3f(5) = 16$

$f(3) = f(2+1) = \frac{2}{f(3)} + 3f(16) = 48.66$

$f(4) = f(3+1) = \frac{2}{f(4)} + 3f(48.66) = 146.48$

2

KEMENTERIA PENDIDIKAN MALAYSIA / POLITEKNIK MALAYSIA		COURSE CODE/ COURSE NAME		DBM2033 DISCRETE MATHEMATICS	
		COURSEWORK ASSESSMENT		QUIZ 3	
		SESSION		DECEMBER 2018	
JABATAN MATEMATIK, SAINS DAN KOMPUTER		DURATION	15 MINS	CLO1	10 MARKS
NAME	Flarelynn Kalong			CLO2	
REGISTRATION NO.	05DDT18F1067			CLO3	
PROGRAMME/ SECTION	DDT2B	TOTAL MARKS		10 MARKS	

6½

Instructions

- Answer ALL questions. Write your answers in the spaces provided.
- Show your working to get marks. You may use a non-programmable scientific calculator.

Question 1

CLO2, C3 [6 marks]

Let P(n) is the statement of $1 + 4 + 7 + 10 + \cdots + (3n - 2) = \frac{n(3n-1)}{2}$, where n is all positive integer.

(a) Show that P(1) is true.

(b) Complete the inductive step.

induct

Question 2

CLO2, C2 [4 marks]

Suppose f is recursively defined by $f(0) = 1$ and $f(n+1) = \frac{2}{f(n)} + 3f(n)$.

Count $f(4)$.

Answer :

Question 1

(a) $P(1) : (3n - 2) = \frac{n(3n-1)}{2}$

$(3(1)-2) = \frac{1(3(1)-1)}{2}$

$1 = \frac{2}{2}$

$= 1$

∴ Both sides equal to 1.

2½

(b) $1 + 4 + 7 + 10 + \ldots + (3k+1-2)$

$= \frac{k+1(3k+1-1)}{2}$

$= k(3k-1) + 2(3k+1-2)$

$= \frac{k(3k-1) + 2(3k-1)}{2}$

$= \frac{3k^2 - k + 6k - 2}{2}$

$=$

Question 2

$f(0) = 1$

$f(n+1) = \frac{2}{f(n)} + 3f(n)$

$f(1) = f(0+1) = \frac{2}{f(0)} + 3f(0)$, $f(2) = f(1+1) = \frac{2}{f(1)} + 3f(1)$

$= \frac{2}{1} + 3(1)$ $\qquad \frac{2}{5} + 3(5)$

$= 2 + 3$ $\qquad = 0.4 + 15$

$= 5$ $\qquad = 15.4$

$$f(3) = f(2+1) = \frac{2}{f(2)} + 3f(2)$$

$$= \frac{2}{15.4} + 3(15.4)$$

$$= 0.129 + 46.2$$

$$= 46.329$$

$$f(4) = f(3+1) = \frac{2}{f(3)} + 3f(3)$$

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$$= \frac{2}{46.329} + 3(46.329)$$

$$= 0.043 + 138.987$$

$$= 139.03$$

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$6\frac{1}{2}$

F1047

Question 1.

a) $P(1): (3(1)-2) = \frac{1(3(1)-1)}{2}$

$: 1 = 1$

Both side equal to 1

2/2

b) $(3(k)-2) + (k+1)^3$

$= \frac{k(3(k-1)) + 2(k+1)^3}{2}$

$= \frac{(3k-1)[k+2(k+1)]}{2}$

$= \frac{(3k-1)(k+2k+1)}{2}$

$= \frac{(3k-1)(3k+1)}{2}$

Question 2.

$f(0) = 1$

$f(n+1) = \frac{2}{f(n)} + 3f(n)$

$f(1) = f(0+1) = \frac{2}{f(0)} + 3f(0)$

$= \frac{2}{1} + 3(1)$

$= 5$

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Date :

$f(2) = f(1+1) = \frac{2}{f(1)} + 3f(1)$

$= \frac{2}{5} + 3(5)$

$= 15.4$

$f(3) = f(2+1) = \frac{2}{f(2)} + 3f(2)$

$= \frac{2}{15.4} + 3(15.4)$

$= 46.33$

$f(4) = f(3+1) = \frac{2}{f(3)} + 3f(3)$

$= \frac{2}{46.33} + 3(\cancel{46}\ 46.33)$

$= 139.03$

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