INSTRUCTION:

Answer all ...

TOTAL MARKS

NO: TING UK SIONG

DATE:

Question 1

~~(a) P(1)~~ $\cancel{1 = 1^2}$

$\cancel{1 = 1}$

~~(b)~~

~~Let P(n)~~

P(1) P(2)

(a) $1+3+5+\dots+(2n-1)=n^2$

$P(1): 2(1)-1 = 1^2$

$2-1 = 1^2$

$1 = 1$

P(1) is true, because both side is 1

1

(b) Inductive hypothesis

$1+3+5+\dots+(2n-1)=n^2$

$1+3+5+\dots+(2k-1)=k^2$

1

(c) ~~(b)~~ Inductive step

$1+3+5+\dots+(2k-1)+(k+1)=(k+1)^2$

$(k+1)^2 = (k+1)(k+1)$

$(k+1)(k+1) = k^2+k+k+1$

$k^2+k+k+1 = k^2+2k+1$

$k^2+2k+1 = k^2+2k+1$

How?

Conclusion:

We have complete the basic step and Inductive step, the statement is true for all positive integers n.

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Question 2

$f(0) = 2$

$f(n+1) = 3f(n) - 2[3 - f(n)]$

a) $f(1)$

$n+1 = 1$
$n = 1-1$
$= 0$

$f(0+1) = 3f(0) - 2[3 - f(0)]$

$f(1) = 3(2) - 2(3-2)$

$= 6 - 6 + 4$

$f(1) = 4$

4

$n+1 = 2$
$n = 2-1$
$= 1$

b) $f(2)$

$f(1+1) = 3f(1) - 2[3 - f(1)]$

$= 3(4) - 2(3-4)$

$= 12 - 6 + 8$

$= 14$

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1. $P(n) : 1+3+5+ \dots + (2n-1) = n^2$

a) $P(1) : 1+3+5+ \dots + 2(1)-1 = 1^2$

$P(1) : 2(1)-1 = 1^2$

$2-1 = 1^2$

$1 = 1$

The basis step completed and shows the $P(1)$ is true.

b) Inductive hypothesis

$P(n) : 1+3+5+ \dots + (2n-1) = n^2$

$\rightarrow P(k) : 1+3+5+ \dots + (2k-1) = k^2$

c) $P(k) : 1+3+5+ \dots + (2k-1) = k^2$

$(2k-1) = k^2 (2k-1)$

$(2(1)-1) = k^2 (2(1)-1)$

$(2-1) = k^2 (2-1)$

$1 = k^2 (1)$

$1 = k^2$

Both basis step and inductive step completed. So, ~~is~~ by the principle of mathematical induction, the statement is true for every positive integer n.

2. $f(0) = 2$

$f(n+1) = 3f(n) - 2[3-f(n)]$

$n = 1, 2, 3$

a) $f(1)$

$f(0)+1 = 3f(0) - 2[3-f(0)]$

$f(1) = 3(2) - 2[3-2]$

$= 6 - 2(1)$

$= 4$

b) $f(2)$

$f(1+1) = 3f(1) - 2[3-f(1)]$

$f(2) = 3(4) - 2[3-4]$

$= 12+2$

$= 14$

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Question 1

a) $P(1) = (2(1) - 1) = 1^2$

Basis step $P(1) = (2(1) - 1) = 1^2$

$2 - 1 = 1^2$

$1 = 1$

In basis step $P(1)$, show that both side is equal to 1, so $P(1)$ is true

1

b) $1 + 3 + 5 + \dots + (2n - 1) = n^2$

Add k

$1 + 3 + 5 + \dots + (2k - 1) = k^2$

1

c) $1 + 3 + 5 + \dots + (2k - 1) = k^2$

~~P k~~ $P(k) \rightarrow P(k+1)$

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

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

$k^2 + 2k + 1 = k^2 + 1k + 1k + 1$

$k^2 + 2k + 1 = k^2 + 2k + 1$

$= k^2 + 2k + 1$

How

Conclusion

We ~~done~~ already done basis step and inductive step. So that is proof for where ~~n integer is true n is all positive~~ n ~~integer~~ integer is true

Subject:.. Date:

Question 2

$f(0)=2$ and $f(n+1) = 3f(n) - 2[3-f(n)]$

~~$f(1) = f(0)f$~~

~~$f(1) = f(0+1) = 3(0)(0) = 2$~~

$f(1) = f(0+1) = 3(0) - 2[3-(0)] = 3(2) - 2[3-(2)] = 4$

$f(2) = f(1+1) = 3(1) - 2[3-(1)] = 3(4) - 2[3-(4)] = 14$

$f(3) = f(2+1) = 3(2) - 2[3-(2)] = 3(14) - 2[3-(14)] = 64$

$f(1) = 4$

$f(2) = 14$

4

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Subject:
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Answer.

Question 1

1

a) $P(1)$ $(2n-1) = n^2$

$2(1)-1 = 1^2$

$1 = 1$

Both side is equal therefore $P(1)$ is true.

b) # replace n ~~with~~ to k

$(2n-1) = n^2$

$\downarrow$

$(2k-1) = k^2$

1

c) $(2k-1) = k^2 (2k-1)$

$= 1 (2k-1)$

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

we have completed the both basis s... and inductive step, by the mathematical principle the $P(1)$ is true.

1

Question 2

$f(1) = 4$

$f(2) = 34$

2

a) $f(1) = f(0+1)$

$= 3(1)(2) - 2[3-1(2)]$

$= 6 - 2$

$= 4$

b) $f(2) = f(1+1)$

$= 3(2)(4) - 2[3-2(4)]$

$= 24 - (-10)$

$= 34$

$P(n)$: $1+3+5+\dots+(2n-1) = n^2$

1. a) $P(1) = n^2$
$1 = (1)^2$
$1 = 1$

$P(2) = n^2$
$1+3 = (2)^2$
$4 = 4$

b) Inductive hypothesis is when all positive value in basis step is true, then the inductive step will be assumed true.

c) Inductive step

assume $n = k$;

$1+3+5+\dots+(2k-1) = k^2$

$\underbrace{1+3+5+\dots+(2k-1)}_{k^2} + (k+1) = k^2 + (k+1)$

$k^2 + (k+1) = k^2 + (k+1)$

$k^2 + (k+1) = k^2 + k + 1$; when both sides are equal, the statement ~~ist~~ is true.

$f(n+1) = 3f(n) - 2[3 - f(n)]$; $n = 1, 2, 3, \dots$; $f(0) = 2$

2. a) Find $f(1)$

$f(0+1) = f(1) = 3f(0) - 2[3 - f(0)]$ $f(0) = 2$
$= 3(2) - 2[3 - (2)]$
$= 6 - 2[1]$
$= 6 - 2$
$= 4$ *

b) find $f(2)$

$f(1+1) = f(2) = 3f(1) - 2[3 - f(1)]$
$= 3(4) - 2[3 - (4)]$
$= 12 - 2[-1]$
$= 12 - (-2)$
$= 12 + 2$
$= 14$ *

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OSDDT17F2003

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$1+2+3+\dots+k+k+1\;n(n+1)$

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Question 1.

a) Let $P(n): 1+3+5+\dots+(2n-1)=n^2$

Basis step : $P(1) = (2n-1) = n^2$

$= (2(1)-1) = 1^2$

$= 1 = 1$

both side equal to 1

1

b) Inductive hypothesis

$P(n): 1+3+5+\dots+(2n-1)=n^2$

c) Inductive step : Let $P(n) : 1+3+5+\dots+(2n-1)+[(2n-1)+1]=n^2$

change n to k

$P(n): 1+3+5+\dots+(2k-1)+[(2k-1)+1] = k^2+[(2k-1)+1]$

$2k-1+2k-1+1 = k^2+2k-1+1$

$2k-1 = k^2+2k$

$1 = 1$

After completing the basis step and inductive step, we can conclude that the statement is true where n is all positive integers

Question 2

a) $f(1)$

$f(0+1) = 3f(0)-2[3-f(0)]$

$f(1) = 3f(2)-2[3-f(0)]$

$= 3f0 - 2[2-fc$

$f(0+1) = 3f(0)-2[3-f(0)]$

$f(1) = 3(2)-2(3-2)$

$= 6-2(1)$

$f(1) = 4$

b) $f(2)$

$f(1+1) = 3(4)-2(3-4)$

$= 12-2(-1)$

$= 12+2$

$f(2) = 14$

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Date: 3 18 2018

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Question 1

(a) $P(1) = (2(1)-1) = (1)^2$

$= 2-1 \quad = 1$

$1 = 1$

Since both side has the same value, so P(1) is true.

2

(b) $1+3+5+\ldots+(2k-1)+k+1 = (k+1)^2$

1

(c) $1+3+5+\ldots+(2k-1)+k+1 = (k+1)^2 + k+1$

$= (k+1)(k+1) + k+1$

$= k^2+k+k+1+k+1$

$= k^2+3k+2$

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

Since we compreted both the basic step and inductive step, so in mathematical conclusion $(k+1)(k+2)$ is true for every positive integer.

Question 2

Statement : $F(n+1)$

$3F(n)-2[3-F(n)]$

$F(0) = 2 \quad F(1) = 4 \quad F(2) = 10$

(a) $F(1) : F(0+1)$

$= 3F(0)-2[3-F(0)]$

$= 3(2)-2[3-(2)]$

$= 4(1)$

$= 4$

2

(b) $F(2) : F(1+1)$

$= 3F(1)-2[3-F(1)]$

$= 3(4)-2[3-(4)]$

$= 10$

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$1+3+5+\ldots+(2n-1)=n^2$

(a) show $p(1)$ is true

basis step

$p(1)\ 1=1^2$

$1=1$ True

both side must be same

(b) what is the inductive hypothesis?

$k2^2+2k+(2-1)=(k+1)(k+1)$

(c) complete the inductive step and make conclusion

$1+3+5+\ldots+(2k-1)=k^2$

$p(k+1): k^2+[2(k+1)-1] = (k+1)^2$

$: k2^2+2k+(2-1)=(k+1)(k+1)$

$: k2^2+2k+1=k^2+2k+1$

The ~~Statement~~ ~~statement~~ is true ~~whenever~~ ~~the~~ number is positive integer

Subject:

Question 2

$f(0) = 2$

a) $f(1) =$

$f(1) : f(1+1) = 3f(1) - 2[3 - f(1)$

$: f(\tau) :$

$:$

b) $f(2) =$

$f(2) : f(2+1) = 3f(2) - 2[3 - f($

$: 3$

Isna Ayu

Subject: 2015

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Question 1.

(a.) P(1) :

P1 : $1+3+5+\cdots+(2n-1)=n^2$

$$(2(1)-1)=1^2$$
$$(2-1)=1$$
$$1=1$$

Both sides are equal to 1, so the statement is true.

1

(b.) Inductive hypothesis :

$$1+3+5+\cdots+(2k-1)=k^2$$

1

(c.) Inductive step & conclusion :

For each $k \geq 1$ that $p(k)$ implies $p(k+1)$, in other words assuming that inductive hypothesis (b) we can show...

$$1+3+5+\cdots+(2k-1)+(2(k+1)-1)=(k+1)^2$$

How

Prove :

$$1+3+5+\cdots+(2k-1)+(2(k+1)-1) = k^2+(2(k+1)-1)$$
$$= k^2+(2k+2-1)$$
$$= k^2+(2k-1)$$
$$= 2k^2-k^2$$
$$= k^2.$$

Conclusion :

Since we have completed both basis step and inductive hypothesis, by the principle of mathematical induction, the statement for every positive integer n is true.

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Question 2.

$f(0) = 2,$

$f(n+1) = 3f(n) - 2[3 - f(n)]$

a.) $f(1):$

$\cancel{f(0+1) = 3f(1) - 2[3 - f(1)]}$

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

$\cancel{= 3f - 6 + 2f}$

$\cancel{= 5f - 6}$

$\cancel{f(1) = 3f(1) - 2[3 - f(1)]}$

$\cancel{= 3f - 2(3-f)}$

$\cancel{= 3f + 6f}$ $\cancel{= 3f - 2(2f)}$

$\cancel{= 9f.}$ $\cancel{= 3f - 4f}$

$\cancel{f(1) = 9}$

$f(0+1) = 3f(1) - 2[3 - f(1)]$

$= 3f - 2[3 - f]$

$= 3f - 2(3-f)$

$= 3f + 6f$

$= 9$

$f(1) = 9.$

b.) $f(2):$

$f(2) = 3f(2) - 2[3 - f(2)]$

$= 6f - 2(3 - 2f)$

$= 6f - 2(f)$

$= 6f - 2f$

$= 4$

$f(2) = 4$