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ASSIGNMENT-1 1/4

Exercise-1

Yes, the student can pass by performing good in Homeworks assignment.

The student got in Mid-term

= 50% of 30% => 15%

And he got in final exam.

40% of 40% => 16%

Then he has total => 15+16 = 31%

And total passing point is 60%

He require = 60% - 31% = 29%

And homeworks assignment has 30%. Then the student got 29% of his homeworks point

He is passed.

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Exercise-2

$$\sum_{k=1}^{n} k^2 = \frac{n(n+1)(2n+1)}{6}$$

Base case : $n = 1$

$$\sum_{k=1}^{1} (1)^2 = \frac{1(1+1)(2(1)+1)}{6} = \frac{(2)(3)}{6} = \frac{6}{6} = 1$$

Induction hypothesis –

Suppose $\sum_{k=1}^{n} k^2 = \frac{n(n+1)(2n+1)}{6}$ is true.

Induction step : $\sum_{k=1}^{n+1} k^2 = \frac{(n+1)((n+1)+1)(2(n+1)+1)}{6}$

$$= \sum_{k=1}^{n} k^2 + (n+1)^2 = \frac{(n+1)(n+2)(2n+3)}{6}$$

I. H

$$\Rightarrow \frac{n(n+1)(2n+1)}{6} + n^2 + 1 + 2n = \frac{(n^2+2n+n+2)(2n+3)}{6}$$

$$\Rightarrow \frac{(n^2+n)(2n+1)+6(n^2+1+2n)}{6} = \frac{2n^3+3n^2+4n^2+6n+2n^2+3n+4n+6}{6}$$

$$\Rightarrow \frac{2n^3+n^2+2n^2+n+6n^2+6+12n}{6} = \frac{2n^3+9n^2+13n+6}{6}$$

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$$\Rightarrow \frac{2n^3+9n^2+13n+6}{6} = \frac{2n^3+9n^2+13n+6}{6}$$

Exercise 3

$(x+y)(x-y) = (x\cdot x) - (y\cdot y)$

$(x+y)(x+(-y))$ $\quad (-y = +(-y))$

(F5) Distributivity

$((x+y)\cdot x) + ((x+y)\cdot(-y))$

(F5) Distributivity

$((x\cdot x)+(y\cdot x)) + ((x\cdot(-y)+(y\cdot(-y)))$

$(((x\cdot x)+(y\cdot x))+(x(-y))) + (y(-y))$ (F1) Associative

$((x\cdot x)+((y\cdot x)+(x(-y)))+(y\cdot(-y))$ (F1) Associative

$((x\cdot x)+((y\cdot x)-(y\cdot x)))+(y\cdot(-y))$ (F2) commutativity

$((x\cdot x)+0)+(y\cdot(-y))$ (F4) Inverse elements

$(x\cdot x)+(y\cdot(-y))$ (F3) Identity elements

$(x\cdot x)-(y\cdot y) = (x\cdot x)-(y\cdot y)$

Proved

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BONUS Question

In equation $a(a+b-c) = b(b+a-c)$ is equal to 0. because $1+2-3=0$ than both sides is zero than it is not arrived $a=b$ it comes $0=0$.