$$MAT 201 REVISION. $$

$$QUESTION 1 $$

$$ Given that f\left(x,y\right)=\sin(\left(2x+3y\right).) Find f\_{y}\left(-6,4\right) $$

$$Solution.$$

$$f\left(x,y\right)=\sin(\left(2x+3y\right).) $$

$$ f\_{y}=3\cos(\left(2x+3y\right))$$

$$f\_{y}\left(-6,4\right)=3\cos(\left(2.-6+3.4\right))=3cos0=3$$

$$QUESTION 2 $$

$$Check if the following equations satisfy Laplace's equation. $$

$$\left(i\right) u=x^{2}+y^{2} \left(ii\right) u=x^{2}-y^{2} $$

$$ $$

$$Solution. $$

$$i) Laplace equation states that u\_{xx}+u\_{yy}=0, $$

$$u=x^{2}+y^{2} u\_{x}=2x, u\_{xx}=2 $$

$$u\_{y}=2y, u\_{yy}=2$$

$$ u\_{xx}+u\_{yy}=2+2=4.$$

$$The equation u=x^{2}+y^{2} did not obey Laplace^{'}s equation since u\_{xx}+u\_{yy}=4 $$

$$ii) Laplace equation states that u\_{xx}+u\_{yy}=0, $$

$$u=x^{2}-y^{2} u\_{x}=2x, u\_{xx}=2 $$

$$u\_{y}=-2y, u\_{yy}=-2$$

$$ u\_{xx}+u\_{yy}=2-2=0.$$

$$The equation u=x^{2}-y^{2} is a Laplace^{'}sequation since u\_{xx}+u\_{yy}=0 $$

$$QUESTION 3 $$

$$Find the value of the following intervals: $$

$$i) \left[4\right.,\left.9\right) ii)\left(10\right.,\left.15\right] iii) \left⟦2,6\right⟧ iv)\left(3,7\right) $$

$$Solution. $$

$$ i) \left[4\right.,\left.9\right)=4,5,6,7,8 $$

$$ ii)\left(10\right.,\left.15\right]=11,12,13,14,15 $$

$$ iii) \left⟦2,6\right⟧ =2,3,4,5,6 $$

$ iv)\left(3,7\right)=4,5,6$

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