**Ch. P.3 Evaluating Functions Practice Worksheet** **Non-AP Calculus**

1) $Find\ \frac{f(x+\Delta x)-f(x)}{\Delta x}$ for f(x) = 2x – 5

2) $Find\ \frac{f(x+\Delta x)-f(x)}{\Delta x}$ for $f(x) = 1 - x + 2x^2$

3) $Find\ \frac{f(x)-f(2)}{x-2}$ for $f(x) = 7x^2 + 1$

4) $Find\ f(x-3)-f(x)$ for f(x) = 5 – 6x

5) $Find\ \frac{f(x+h)-f(x)}{h}$ for f(x) = 3 – $2x^2$

6) $Find\ \frac{f(x+h)-f(x)}{h}$ for f(x) = $\sqrt{2x-1}$

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Key

1) *Find* $\frac{f(x+\Delta x)-f(x)}{\Delta x}$ for f(x) = 2(x) – 5

$f(\ ) = 2(\ )-5$

$f(x+\Delta x) = 2(\ )-5$

$f(x+\Delta x) = 2(x+\Delta x)-5$

$$\frac{2(x+\Delta x)-5-(2x-5)}{\Delta x}$$

$$\frac{2x+2\Delta x-5-2x+5}{\Delta x}$$

$$\frac{2\Delta x}{\Delta x} = \boxed{2}$$

2) *Find* $\frac{f(x+\Delta x)-f(x)}{\Delta x}$ for f(x) = 1 – (x) + 2(x)²

$f(\ ) = 1-(\ )+2(\ )^2$

$f(x+\Delta x) = 1-(x+\Delta x)+2(x+\Delta x)^2$

$$\frac{1-(x+\Delta x)+2(x+\Delta x)^2-(1-x+2x^2)}{\Delta x}$$

$$\frac{1-x-\Delta x+2(x^2+2x\Delta x+\Delta x^2)-1+x-2x^2}{\Delta x}$$

$$\frac{1-x-\Delta x+2x^2+4x\Delta x+2\Delta x^2-1+x-2x^2}{\Delta x}$$

$$\frac{-\Delta x+4x\Delta x+2\Delta x^2}{\Delta x}$$

$$\frac{\Delta x(-1+4x+2\Delta x)}{\Delta x}$$

$$\boxed{-1+4x+2\Delta x}$$

3) *Find* $\frac{f(x)-f(2)}{x-2}$ for f(x) = 7x² +1

$f(2) = 7(2)^2+1 = 29$

$$\frac{7x^2+1-29}{x-2} \rightarrow \frac{7x^2-28}{x-2}$$

$$\frac{7(x^2-4)}{x-2} \rightarrow \frac{7(x+2)(x-2)}{(x-2)} \rightarrow \boxed{7(x+2)}$$

or

$$\boxed{7x+14}$$

4) *Find* $f(x-3)-f(x)$ for f(x) = 5 – 6x

$f(\ ) = 5-6(\ )$

$f(x-3) = 5-6(x-3)$

$= 5-6x+18$

$f(x-3) = 23-6x$

$23-6x-(5-6x)$

$23-6x-5+6x$

$\boxed{18}$

5) *Find* $\frac{f(x+h)-f(x)}{h}$ for f(x) = 3 – 2x²

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

$f(x+h) = 3-2(x+h)^2$

$\frac{3-2(x+h)^2-(3-2x^2)}{h}$

$\frac{3-2(x^2+2xh+h^2)-3+2x^2}{h}$

$\frac{3-2x^2-4xh-2h^2-3+2x^2}{h}$

$\frac{h(-4x-2h)}{h}$

$\boxed{-4x-2h}$

6) *Find* $\frac{f(x+h)-f(x)}{h}$ for f(x) = $\sqrt{2x-1}$

$f(\ ) = \sqrt{2(\ )-1}$

$f(x+h) = \sqrt{2(x+h)-1}$

$\frac{\sqrt{2(x+h)-1}-\sqrt{2x-1}}{h}$

$\boxed{\frac{\sqrt{2x+2h-1}-\sqrt{2x-1}}{h}}$