Average Rate of Change

Find the average rate of change on the given interval

1. $f(x) = 10x - 3$ on $[-2, 5]$

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2. $f(x) = 2x^2 - 5$ on $[-1, 3]$

$(-1, -3)$ $(3, 13)$

$A.R.O.C = \frac{13-(-3)}{3-(-1)} = \frac{16}{4} = 4$

3. $g(x) = \frac{1}{t-2}$ on $[-2, 5]$

$\frac{-\frac{1}{4}-\frac{1}{3}}{-2-5} = \frac{\left(\frac{-7}{12}\right)}{-7} = \frac{1}{12}$ $\left(-2, -\frac{1}{4}\right)$ $\left(5, \frac{1}{3}\right)$

4. $h(x) = 5x^3$ on $[-2, 4]$

$(-2, -40)$ $(4, 320)$

$\frac{320+40}{4+2} = \frac{360}{6} = 60$

5. $f(x) = 2x^2 - 5$ on $[-2, b]$

$(-2, 3)$ $(b, 2b^2-5)$

$\frac{2b^2-5-3}{b+2} = \frac{2b^2-8}{b+2} = \frac{2(b^2-4)}{b+2}$

$= \frac{2(b+2)(b-2)}{b+2}$

$= 2(b-2)$

6. $g(x) = \frac{1}{t-5}$ on $[-2, b]$

$\left(-2, -\frac{1}{7}\right)$ $\left(b, \frac{1}{b-5}\right)$

$\frac{-\frac{1}{7}-\frac{1}{b-5}}{b+2} = \frac{-b^2+7b+10-7b+14}{7(b-5)(b-2)(b+2)}$

$= \frac{-b^2+24}{7(b-5)(b-2)(b+2)}$ $= \frac{(b+2)(b-2)}{7(b-5)(b-2)(b+2)}$

$= \frac{-1}{7b-35}$

7. $f(x) = 2x^2 - 5$ on $[-3, -3 + h]$

$(-3, 13)$

$(-3+h, 2(-3+h)^2-5)$

$\frac{2(-3+h)^2-5-13}{-3+h+3} = \frac{2(9-6h+h^2)-5-13}{h}$

$= \frac{18-12h+2h^2-18}{h}$

$= \frac{2h^2-12h}{h} = \frac{2h(h-6)}{h} = 2h-12$

8. $f(x) = 10x - 3$ on $[x, x + h]$

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