test A

Ex1 Factoriser :

$7(1-x)(3+x)+(3-x)^2$

$= (3-x)\left(7(1-x)+3-x\right)$

$= (3-x)(7-7x+3-x)$

$= \boxed{(3-x)(-8x+10)}$

$25a^2-(a-1)^2$

$= (5a)^2-(a-1)^2$

$= (5a+a-1)(5a-a+1)$

$= \boxed{(6a-1)(4a+1)}$

$3x(2-x)^2+(2-x)$

$= (2-x)\left(3x(2-x)+1\right)$

$= \boxed{(2-x)(6x-3x^2+1)}$

Ex2

1) $f(x) = \frac{5}{4}x^2 - x$

* $f(-2) = \frac{5}{4}(-2)^2-(-2) = \frac{5}{4}\times 4+2 = 5+2 = \boxed{7}$

* $f\left(\frac{2}{3}\right) = \frac{5}{4}\times\left(\frac{2}{3}\right)^2 - \frac{2}{3} = \frac{5}{4}\times\frac{4}{9}-\frac{2}{3}$

$= \frac{5}{9}-\frac{6}{9} = \boxed{-\frac{1}{9}}$

2) $f(x) = -6\left(\frac{5}{3}-x\right)^2$

* $f\left(\frac{1}{2}\right) = -6\left(\frac{5}{3}-\frac{1}{2}\right)^2 = -6\left(\frac{10}{6}-\frac{3}{6}\right)^2 = -6\left(\frac{7}{6}\right)^2$

$= -6\times\frac{49}{36}$

$= \frac{-6\times 49}{6\times 6} = \boxed{-\frac{49}{6}}$

3) $f(x) = \frac{x}{4} - x^2$

* $f(-3) = -\frac{3}{4}-(-3)^2 = -\frac{3}{4}-9 = -\frac{3}{4}-\frac{36}{4} = \boxed{-\frac{39}{4}}$

* $f\left(\frac{5}{4}\right) = \frac{\frac{5}{4}}{4}-\left(\frac{5}{4}\right)^2 = \frac{5}{4}\times\frac{1}{4}-\frac{25}{16} = \frac{5}{16}-\frac{25}{16}$

$= -\frac{20}{16} = \boxed{-\frac{5}{4}}$

4) $f(x) = \frac{1-x^2}{2+4x}$

* $f(-5) = \frac{1-(-5)^2}{2+4\times(-5)} = \frac{1-25}{2-20} = \frac{-24}{-18} = \frac{12}{9} = \boxed{\frac{4}{3}}$

* $f\left(\frac{1}{8}\right) = \frac{1-\left(\frac{1}{8}\right)^2}{2+4\times\frac{1}{8}}$

$= \frac{1-\frac{1}{64}}{2+\frac{1}{2}} = \frac{\frac{63}{64}}{\frac{5}{2}} = \frac{63}{64}\times\frac{2}{5} = \frac{63\times 2}{32\times 2\times 5}$

$= \boxed{\frac{63}{160}}$

test B

Ex 1 Factoriser

$8(2-x)(5-x)+(5-x)^2$
$= (5-x)\left(8(2-x)+(5-x)\right)$
$= (5-x)(16-8x+5-x)$
$= \boxed{(5-x)(21-9x)}$

$36a^2-(a-2)^2$
$= (6a)^2-(a-2)^2$
$= (6a+a-2)(6a-a+2)$
$= \boxed{(7a-2)(5a+2)}$

$4x(3-x)^2+(3-x)$
$= (3-x)\left(4x(3-x)+1\right)$
$= \boxed{(3-x)(12x-4x^2+1)}$

Ex 2

1) $f(x) = -8\left(\frac{3}{2}-x\right)^2$

* $f\left(\frac{1}{6}\right) = -8\left(\frac{3}{2}-\frac{1}{6}\right)^2 = -8\left(\frac{9}{6}-\frac{1}{6}\right)^2 = -8\left(\frac{8}{6}\right)^2$
$= -8\times\frac{64}{36} = -\frac{4\times2\times64}{4\times9}$
$= \boxed{-\frac{128}{9}}$

2) $f(x) = \frac{x}{4}-x^2$

* $f(-5) = -\frac{5}{4}-(-5)^2 = -\frac{5}{4}-25 = -\frac{5}{4}-\frac{100}{4} = \boxed{-\frac{105}{4}}$

* $f\left(\frac{3}{4}\right) = \frac{\frac{3}{4}}{4}-\left(\frac{3}{4}\right)^2 = \frac{3}{4}\times\frac{1}{4}-\left(\frac{3}{4}\right)^2$
$= \frac{3}{16}-\frac{9}{16} = -\frac{6}{16} = \boxed{-\frac{3}{8}}$

3) $f(x) = \frac{3}{25}x^2-x$

* $f(-5) = \frac{3}{25}(-5)^2-(-5) = \frac{3}{25}\times25+5 = 3+5 = \boxed{8}$

* $f\left(\frac{5}{2}\right) = \frac{3}{25}\times\left(\frac{5}{2}\right)^2-\frac{5}{2} = \frac{3}{\cancel{25}}\times\frac{\cancel{25}}{4}-\frac{5}{2}$
$= \frac{3}{4}-\frac{5}{2} = \frac{3}{4}-\frac{10}{4} = \boxed{-\frac{7}{4}}$

4) $f(x) = \frac{2-x^2}{3+2x}$

* $f(-3) = \frac{2-(-3)^2}{3+2\times(-3)} = \frac{2-9}{3-6} = \frac{-7}{-3} = \boxed{\frac{7}{3}}$

* $f\left(\frac{1}{4}\right) = \frac{2-\left(\frac{1}{4}\right)^2}{3+2\times\frac{1}{4}} = \frac{2-\frac{1}{16}}{3+\frac{1}{2}} = \frac{\frac{31}{16}}{\frac{7}{2}}$
$= \frac{31}{16}\times\frac{2}{7} = \frac{31\times2}{8\times2\times7}$
$= \boxed{\frac{31}{56}}$