FUNCTIONS

SINGLE FUNCTIONS

Ref: G294. 4R1

A1 $f(x) = 3x - 5$ Find f(6)	**A2** $f(x) = x^2 - \frac{10}{x}$ Find f(–2)	**A3** $f(x) = \frac{3x+2}{x}$ Find f(0.5)	**A4** $f(x) = \frac{9}{x+2} + \frac{3}{x-1}$ Find f(0)
B1 $f(x) = \sqrt{8-x}$ State the values of x which must be excluded from the domain of f.	**B2** $f(x) = \frac{7}{3x+1}$ State the value of x which must be excluded from the domain of f.	**B3** $f(x) = \frac{5}{x+1} + \frac{2}{x-3}$ State the values of x which cannot be included in any domain of f.	**B4** $f(x) = \sqrt{x-4}$ State the values of x which cannot be included in any domain of f.
C1 $f(x) = 4x - 9$ Express the inverse function f^{-1} in the form $f^{-1}(x) = \ldots$	**C2** $f(x) = \frac{2x}{x-1}$ Express the inverse function f^{-1} in the form $f^{-1}(x) = \ldots$	**C3** $f(x) = \frac{x}{3x+1}$ Find $f^{-1}(x)$	**C4** $f(x) = \sqrt{2x-1}$ Express the inverse function f^{-1} in the form $f^{-1}(x) = \ldots$
D1 $f(x) = 2x - 7$ Given that $f(a) = 3$, work out the value of a	**D2** $f(x) = \frac{1}{2}x + 4$ $f(a) = -2$ Work out the value of a.	**D3** $f(x) = \frac{x}{x-1}$ Solve the equation $f(x) = 1.2$ Show your working clearly.	**D4** $f(x) = \frac{3}{x+1} + \frac{1}{x-2}$ Find the value of x for which $f(x) = 0$ Show your working clearly.

FUNCTIONS

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Ref: G294.4R1

A1

$f(x) = 3x - 5$

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

$= 13$

A2

$f(x) = x^2 - \frac{10}{x}$

$f(-2) = (-2)^2 - \frac{10}{(-2)}$

$= 4 - -5$

$= 9$

A3

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

$f(0.5) = \frac{3(0.5)+2}{(0.5)}$

$= 7$

A4

$f(x) = \frac{9}{x+2} + \frac{3}{x-1}$

$f(0) = \frac{9}{0+2} + \frac{3}{0-1}$

$= 4.5 - 1$

$= 1.5$

B1

$f(x) = \sqrt{8-x}$

the square root of a negative number does not exist

$x > 8$ is not allowed

B2

$f(x) = \frac{7}{3x+1}$

denominators cannot be zero

$x = -\frac{1}{3}$ is not allowed

B3

$f(x) = \frac{5}{x+1} + \frac{2}{x-3}$

denominators cannot be zero

$x = -1$ and $x = 3$ are not allowed

B4

$f(x) = \sqrt{x-4}$

the square root of a negative number does not exist

$x < 4$ is not allowed

C1

$f(x) = 4x - 9$

$f^{-1}(x) = \frac{x+9}{4}$

C2

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

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

C3

$f(x) = \frac{x}{3x+1}$

$f^{-1}(x) = \frac{x}{1-3x}$

C4

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

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

D1

$f(x) = 2x - 7$

$2a - 7 = 3$

$2a = 10$

$a = 5$

D2

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

$\frac{1}{2}a + 4 = -2$

$\frac{1}{2}a = -6$

$a = -12$

D3

$f(x) = \frac{x}{x-1}$

$\frac{x}{x-1} = 1.2$

$x = 1.2x - 1.2$

$x = 6$

D4

$f(x) = \frac{3}{x+1} + \frac{1}{x-2}$

$\frac{3}{x+1} + \frac{1}{x-2} = 0$

$x = 1.25$