

## MATH141 - Worksheet FUNCTIONS

1. If  $f(x) = x^2 + 5x$ , find:
 

(a) $f(2)$	(b) $f(0)$	(c) $f(a)$	(d) $f(a+1)$	(e) $f(a-1)$
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2. If  $g(x) = 5x - 3$ , find:
 

(a) $g(3)$	(b) $g(0)$	(c) $g(a+2)$	(d) $g(b-1)$	(e) $g(3) - g(1)$
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3. If  $f(x) = 4x + 2$ , find:
 

(a) $f(4)$	(b) $f(0)$	(c) $f(-1)$	(d) $f(\frac{1}{2})$	(e) $f(a+h)$
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4. If  $f(x) = 3x^3 + 2$ , find:
 

(a) $f(1)$	(b) $f(-3)$	(c) $f(0)$	(d) $f(a)$	(e) $f(h(a))$
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5. If  $g(x) = 16 - x^2$ , find:
 

(a) $g(2)$	(b) $g(-2)$	(c) $g(6)$	(d) Solve $g(x) = 0$
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6. If  $g(x) = 6x - 2$ , find the values of  $x$  for which
 

(a) $g(x) = 0$	(b) $g(x) = 7$	(c) $g(x) = -1$
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7.  $F(x) = \frac{3x+2}{4x-1}$ . Find
 

(a) $F(1)$	(b) $F(\frac{1}{2})$	(c) Can $F(x)$ have a value when $x = \frac{1}{4}$ ? Why?
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8. If  $h(x) = 4$ , find:
 

(a) $h(1)$	(b) $h(-3)$	(c) $h(0)$	(d) $h(a)$	(e) $h(a-4)$
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9. If  $f(x) = x - \frac{1}{x}$ ,  $x \neq 0$ ,
 

(a) Show that $f(\frac{1}{2}) = f(-2)$ .	(b) If $f(a) = 0$ , find $a$ .
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10. If  $g(x) = x^2 + 3 + \frac{1}{x^2}$ , show that
 

(a) $g(a) = g(\frac{1}{a})$	(b) $g(a) = g(-a)$ .
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11. A function is defined by the rule  $F(x) = \begin{cases} x & x < 0, \\ 2x & x \geq 0, \end{cases}$   
 Find (a)  $F(5)$       (b)  $F(-2)$       (c)  $F(0)$       (d)  $F(a^2)$
12. A function is defined by the rule  $g(x) = \begin{cases} 0 & x \leq -2, \\ -3 & -2 < x < 0, \\ x & x \geq 0. \end{cases}$   
 Find (a)  $g(-2)$       (b)  $g(-1)$       (c)  $g(2)$       (d)  $g(-2) + g(-1) + g(2)$       (e)  $g(a^2)$
13. A function is defined by the rule  $f(x) = \begin{cases} 1-x & x \leq -1, \\ -1 & -1 < x < 1, \\ x+1 & x \geq 1. \end{cases}$   
 Find (a)  $f(1)$       (b)  $f(-1)$       (c)  $f(0)$       (d)  $f(2) + f(-2)$
14. If  $f$  is a function given by  $f(x) = x^2 + 5x - 14$ , then the **zeroes of the function  $f$**  can be found by solving the equation  $f(x) = 0$  i.e.  $x^2 + 5x - 14 = 0$ . The solutions to  $f(x) = 0$  are also called the **roots of the equation**. Determine the zeroes of the following functions:
 

(a) $f(x) = x^2 + 5x - 14$	(b) $f(x) = 2x^2 - 18$	(c) $f(x) = 3(3x - 1)(x + 2)$
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