

# Unit 25: Function Notation

**1. M/J 18/P12/Q11**

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

- (a) Find  $f(-2)$ . [1]
- (b) Find  $f^{-1}(x)$ . [2]

**2. M/J 18/P11/Q15**

$$f(x) = 3 - 2x \qquad g(x) = 4x^3 - 1$$

- (a) Find  $f(5)$ . [1]
- (b) Find  $g(-2)$ . [1]
- (c) Find and simplify  $f(4x^3 - 1)$ . [1]

**3. O/N 17/P12/Q4**

$$f(x) = \frac{x}{4}$$

- (a) Find  $f\left(\frac{1}{2}\right)$ . [1]
- (b) Find  $f^{-1}(x)$ . [1]

**4. O/N 17/P11/Q7**

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

- (a) Find  $f(3.2)$ . [1]
- (b) Find  $f^{-1}(x)$ . [1]

**5. M/J 17/P12/Q14**

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

- (a) Given that  $f(11) = 7$ , find the value of  $k$ . [2]
- (b) Find  $f^{-1}(x)$ . [2]

**6. M/J 17/P11/Q24/b**

$$(a) \quad f(x) = x - 3 \qquad g(x) = x^2 + 1$$

- (i) Find  $f(-5)$ . [1]
- (ii) Find  $m$  given that  $g(m - 3) = 17$ . [3]

**7. O/N 16/P12/Q10**

$$f(x) = 4 + 3x$$

- (a) Find  $f\left(-2\frac{1}{2}\right)$ . [1]
- (b) Find  $f^{-1}(5)$ . [2]

**8. O/N 16/P11/Q11**

$$f(x) = \frac{3 - x}{10}$$

- (a) Evaluate  $f\left(-\frac{1}{2}\right)$ . [1]
- (b) Find  $f^{-1}(x)$ . [2]

**9. M/J 16/P11/Q11**

$$f(x) = 2x - 9$$

- (a) Find  $f\left(-\frac{3}{4}\right)$ . [1]
- (b) Find  $f^{-1}(3)$ . [2]

**10. O/N 15/P12/Q4**

$$f(x) = 1 + 4x$$

- (a) Find  $f\left(-\frac{2}{5}\right)$ . [1]
- (b) Find  $f^{-1}(x)$ . [1]

**11. O/N 15/P11/Q17**

$$f(x) = 5 + x^2$$

Find  $t$  given that  $f(3 - t) = 9$ . [3]

**12. O/N 14/P12/Q4**

$$f(x) = 2(x - 3)$$

- (a) Evaluate  $f\left(\frac{1}{2}\right)$ . [1]
- (b) Find  $f^{-1}(x)$ . [1]

**13. M/J 14/P12/Q13**

$$f(x) = 2 - 3x$$

Find

- (a)  $f(-5)$ , [1]
- (b)  $f^{-1}(x)$ . [2]

**14. O/N 13/P12/Q3**

$$f(x) = 2x - 6$$

- (a) Evaluate  $f\left(-\frac{1}{2}\right)$ . [1]
- (b) Find  $f^{-1}(x)$ . [1]

**15. O/N 13/P11/Q13**

$$f(x) = \frac{7 - 3x}{2x}$$

- (a) Find  $f(4)$ . [1]
- (b) Find  $f^{-1}(x)$ . [2]

**16. O/N 12/P12/Q4**

$$f(x) = 5 + 3x$$

- (a) Evaluate  $f\left(-\frac{1}{2}\right)$ . [1]
- (b) Find  $f^{-1}(x)$ . [1]

**17. O/N 12/P11/Q20**

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

- (a) Find  $f^{-1}(x)$ . [1]
- (b) Given that  $f(-9) + f(t) = A + Bt$ , find the values of  $A$  and  $B$ . [2]

**18. M/J 12/P12/Q19**

**(a)**  $f(x) = x^3 - 4$

Find

**(i)**  $f(-2)$ ,

[1]

**(ii)**  $f^{-1}(x)$ .

[1]

**(b)**  $g(y) = y^2 - 3y + 1$

Write down and simplify an expression for  $g(a - 2)$ .

[2]

**19. M/J 12/P11/Q25**

$f(x) = 6x^2 - x + 3$

**(a)** Find

**(i)**  $f(2)$ ,

[1]

**(ii)**  $f(-1)$ ,

[1]

**(iii)** the values of  $x$  for which  $f(x) = 5$ .

[2]

**(b)** Write down and simplify an expression for  $f(a + 1)$ .

[2]

**20. O/N 11/P12/Q4**

It is given that  $f(x) = \frac{3+x}{2}$ .

**(a)** Find  $f(-3)$ .

[1]

**(b)** Find  $f^{-1}(x)$ .

[1]

**21. O/N 11/P11/Q5**

Given that  $f(x) = \frac{2x+3}{5x}$ , find  $f^{-1}(x)$ .

[2]

**22. M/J 11/P11/Q20**

It is given that  $h(x) = 2x - 5$  and  $g(x) = \frac{3}{x-2}$ .

Find

**(a)**  $h(4)$ ,

[1]

**(b)**  $g^{-1}(x)$ ,

[2]

**(c)** the value of  $t$  such that  $h(t) = g(3)$ .

[2]

**23. O/N 10/P12/Q12, O/N 10/P13/Q12**

$f(x) = 6 - \frac{x}{2}$

**(a)** Find  $f(5)$ .

[1]

**(b)** Find  $f^{-1}(x)$ .

[2]

**24. M/J 10/P12/Q11, M/J 10/P13/Q11**

Given that  $f(x) = \frac{5-2x}{3x}$ , find

**(a)**  $f(-2)$ ,

[1]

**(b)**  $f^{-1}(x)$ .

[2]

**25. O/N 09/P1/Q12**Given that  $f(x) = 4x - 7$ , find

**(a)**  $f\left(\frac{1}{2}\right)$ ,

[1]

**(b)** the value of  $p$  when  $f(p) = p$ .

[2]

**26. M/J 09/P1/Q16**

It is given that  $f(x) = 12 - 5x$ .

Find

- (a)  $f(4)$ , [1]  
(b) the value of  $x$  for which  $f(x) = 17$ , [1]  
(c)  $f^{-1}(x)$ . [2]

**27. O/N 08/P1/Q12**

Given that  $f(x) = \frac{4x+3}{2x}$ , find

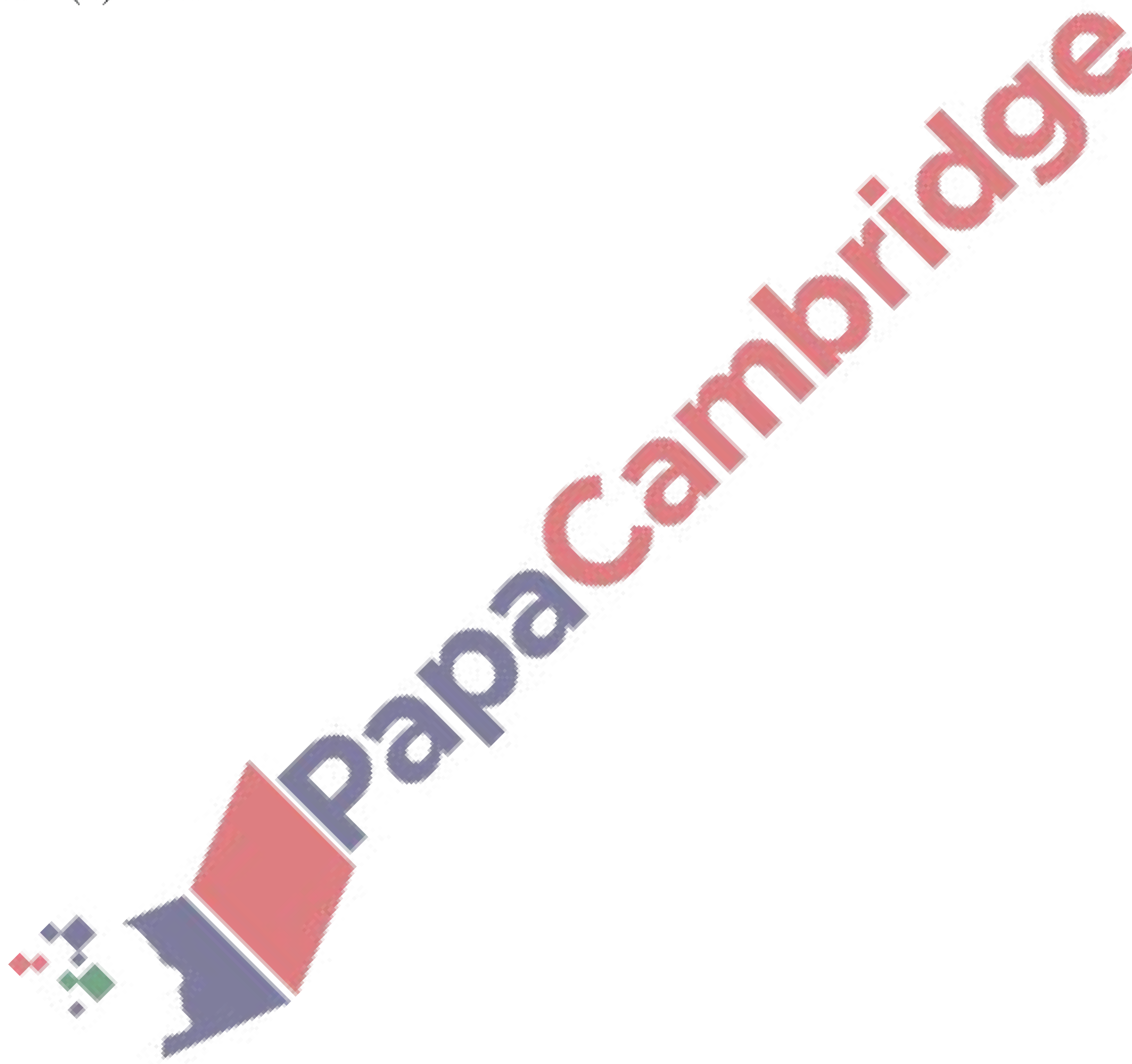
- (a)  $f(3)$ , [1]  
(b)  $f^{-1}(x)$ . [2]

**28. M/J 08/P1/Q3**

It is given that  $f(x) = 5x + 2$ .

Find

- (a)  $f(-2)$ , [1]  
(b)  $f^{-1}(x)$ . [1]



## Answers Section

- 1. M/J 18/P12/Q11**
- (a)  $-\frac{1}{4}$  oe 1
- (b)  $\frac{1-2x}{3x}$  oe final answer 2
- 2. M/J 18/P11/Q15**
- (a)  $-7$  1
- (b)  $-33$  1
- (c)  $5 - 8x^3$  Final answer 1
- 3. O/N 17/P12/Q4**
- (a)  $\frac{1}{8}$ ; or 0.125 1
- (b)  $4x$  1
- 4. O/N 17/P11/Q7**
- (a) 16.6 1
- (b)  $\frac{x-7}{3}$  oe 1
- 5. M/J 17/P12/Q14**
- (a) 5 2
- (b)  $\frac{4x+k}{3}$  or  $\frac{4x+5}{3}$  oe final answer 2
- 6. M/J 17/P11/Q24/b**
- (a) (i)  $-8$  1
- (ii)  $-1$  or  $7$  3  
with correct working
- 7. O/N 16/P12/Q10**
- (a)  $-3.5$  or any equivalent 1
- (b)  $\frac{1}{3}$  2
- 8. O/N 16/P11/Q11**
- (a) 0.35 oe 1
- (b)  $3 - 10x$  oe 2
- 9. M/J 16/P11/Q11**
- (a)  $-10\frac{1}{2}$  oe 1
- (b) 6 2
- 10. O/N 15/P12/Q4**
- (a)  $-\frac{3}{5}$ , or  $-0.6$  1
- (b)  $\frac{x-1}{4}$  oe 1
- 11. O/N 15/P11/Q17**
- 1 or 5 WWW 3
- 12. O/N 14/P12/Q4**
- (a)  $-5$  1
- (b)  $\frac{x+6}{2}$  oe 1
- 13. M/J 14/P12/Q13**
- (a) 17 1
- (b)  $\frac{2-x}{3}$  oe 2
- 14. O/N 13/P12/Q3**
- (a)  $-7$  1
- (b)  $\frac{x+6}{2}$  oe 1
- 15. O/N 13/P11/Q13**
- (a)  $-\frac{5}{8}$ , or  $-0.625$ , only 1
- (b)  $\frac{7}{2x+3}$  oe 2
- 16. O/N 12/P12/Q4**
- (a)  $3\frac{1}{2}$  oe 1
- (b) oe 1
- 17. O/N 12/P11/Q20**
- (a)  $2x - 3$  1
- (b)  $A = -\frac{3}{2}$  oe 1
- $B = \frac{1}{2}$  oe 1
- 18. M/J 12/P12/Q19**
- (a) (i)  $-12$  1
- (ii)  $\sqrt[3]{x+4}$  oe 1
- (b)  $a^2 - 7a + 11$  2

**19. M/J 12/P11/Q25**

- (a) (i) 25 1  
 (ii) 10 1  
 (iii)  $\frac{2}{3}$   $-\frac{1}{2}$  2  
 (b)  $6a^2 + 11a + 8$  2

**20. O/N 11/P12/Q4**

- (a) 0 cao 1  
 (b)  $2x - 3$  1

**21. O/N 11/P11/Q5**

- $\frac{3}{5x-2}$  or any equiv. 2

**22. M/J 11/P11/Q20**

- (a) 3 1  
 (b)  $\frac{3+2x}{x}$  oe 2  
 (c) 4 2

**23. O/N 10/P12/Q12, O/N 10/P13/Q12**

- (a)  $3\frac{1}{2}$ , or  $\frac{7}{2}$ , or 3.5, only 1  
 (b)  $12 - 2x$  or any equivalent 2

**24. M/J 10/P12/Q11, M/J 10/P13/Q11**

- (a) -1.5 1  
 (b)  $\frac{5}{3x+2}$  2

**25. O/N 09/P1/Q12**

- (a) -5 cao 1  
 (b)  $2\frac{1}{3}$ ,  $\frac{7}{3}$ , 2.33 or better 2

**26. M/J 09/P1/Q16**

- (a) -8 1  
 (b) -1 1  
 (c)  $\frac{12-x}{5}$  oe (e.g. asc) 2

**27. O/N 08/P1/Q12**

- (a)  $2\frac{1}{2}$ , 2.5,  $\frac{5}{2}$ , or  $2\frac{3}{6}$  1  
 (b)  $\frac{3}{2x-4}$  o.e. 2

**28. M/J 08/P1/Q3**

- (a) -8 1  
 (b)  $\frac{x-2}{5}$  oe 1