

# Evaluating Piecewise Functions

Evaluate each function.

1)  $f(x) = \begin{cases} -x-4 & , x \leq 5 \\ 2x^2-7 & , 5 < x \leq 10 \end{cases}$

i)  $f(-2) = \begin{aligned} f(x) &= -x-4 \\ f(-2) &= -(-2)-4 \\ f(-2) &= 2-4 \\ \boxed{f(-2) &= -2} \end{aligned}$

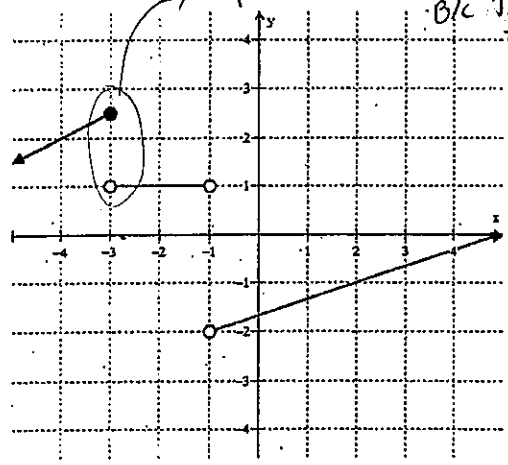
ii)  $f(7) = \begin{aligned} f(x) &= 2x^2-7 \\ f(7) &= 2(7)^2-7 \\ f(7) &= 2(49)-7 \\ f(7) &= 98-7 \\ \boxed{f(7) &= 91} \end{aligned}$

2)  $f(x) = \begin{cases} x^2 & , -15 \leq x \leq 0 \\ x-5 & , 0 < x \leq 15 \end{cases}$

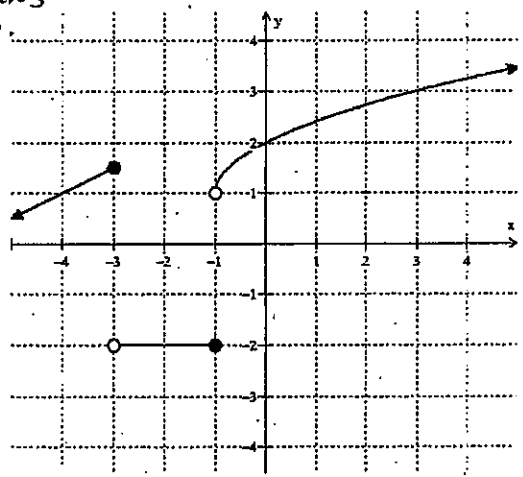
i)  $f(-5) = \begin{aligned} f(x) &= x^2 \\ f(-5) &= (-5)^2 \\ \boxed{f(-5) &= 25} \end{aligned}$

ii)  $f(15) = \begin{aligned} f(x) &= x-5 \\ f(15) &= 15-5 \\ \boxed{f(15) &= 10} \end{aligned}$

B) Graphically - If there is 1 open & 1 closed dot, choose the closed dot. B/c that means equal to.



$f(2) = -1$   
 $f(-3) = 2.5$  (closed dot)  
 $f(-1) = \text{NO solution}$  (B/c both are open dots)  
 $f(-4) = 2$



$f(0) = 2$   
 $f(-4) = 1$   
 $f(-1) = -2$  (closed dot)  
 $f(3) = 3$

If  $f(x) = \begin{cases} (x+4)^2 & , -20 \leq x \leq 0 \\ 3x^2-x & , 0 < x \leq 20 \end{cases}$ ; what is the value of  $f(-11)$ ?

$f(x) = (x+4)^2$   
 $f(-11) = (-11+4)^2$   
 $f(-11) = (-7)^2$   
 $f(-11) = 49$

i) 132

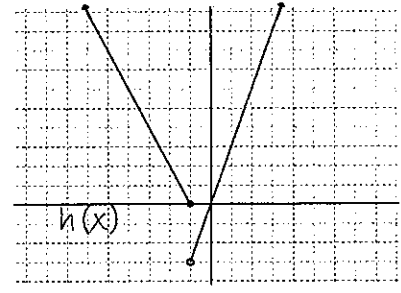
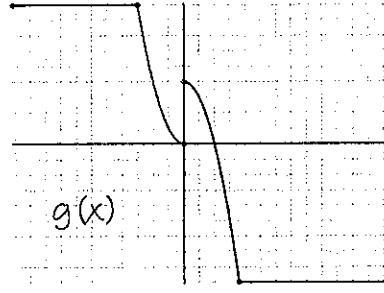
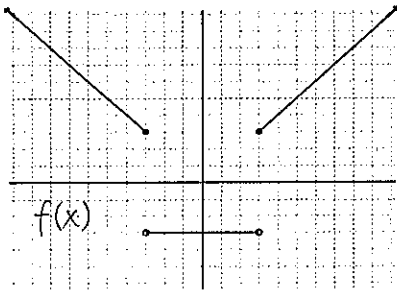
ii) -110

iii) 49

iv) -81

KEY Evaluating Piecewise Functions (1)

Name Key



Use the graphs above to evaluate the functions.

- |                 |                 |                 |                  |
|-----------------|-----------------|-----------------|------------------|
| 1. $f(0) = -3$  | 2. $h(-1) = 0$  | 3. $g(0) = 4$   | 4. $f(3) = 3$    |
| 5. $g(-4) = 9$  | 6. $f(-3) = 3$  | 7. $g(10) = -9$ | 8. $h(0) = 0$    |
| 9. $h(-3) = 0$  | 10. $g(8) = -9$ | 11. $f(1) = -3$ | 12. $f(5) = 5$   |
| 13. $h(-2) = 2$ | 14. $g(1) = 3$  | 15. $h(2) = 6$  | 16. $f(-5) = -5$ |

Extra Question: If  $g(x) = -4$  what is the value of  $x$ ?  $x = 3$

$$f(x) = \begin{cases} 2x & x > 3 \\ x & 0 \leq x \leq 3 \\ x-1 & x < 0 \end{cases} \quad g(x) = \begin{cases} \sqrt{x} & x \geq 0 \\ \sqrt{-x} & x < 0 \end{cases} \quad h(x) = \begin{cases} 5 & x > -1 \\ 2x & x \leq -1 \end{cases} \quad j(x) = \begin{cases} 3 & x = 5 \\ -2x+1 & x \neq 5 \end{cases}$$

- |  |  |   |  |
|--|--|---|--|
| 1. $f(0) = 0$<br>$f(x) = x$<br>$f(0) = 0$                              | 2. $g(0) = 0$<br>$g(x) = \sqrt{x}$<br>$g(0) = \sqrt{0}$<br>$g(0) = 0$  | 3. $h(0) = 5$<br>$h(x) = 5$<br>$h(0) = 5$   | 4. $j(0) = 1$<br>$j(x) = -2x+1$<br>$j(0) = -2(0)+1$<br>$j(0) = 0+1$<br>$j(0) = 1$                    |
| 5. $f(3) = 3$<br>$f(x) = x$<br>$f(3) = 3$                              | 6. $f(-3) = -4$<br>$f(x) = x-1$<br>$f(-3) = -3-1$<br>$f(-3) = -4$      | 7. $g(-4) = 2$<br>$g(x) = \sqrt{-x}$<br>$g(-4) = \sqrt{-(-4)}$<br>$g(-4) = \sqrt{4}$<br>$g(-4) = 2$ | 8. $h(3) = 5$<br>$h(x) = 5$<br>$h(3) = 5$  |
| 9. $f(-5) = -6$<br>$f(x) = x-1$<br>$f(-5) = -5-1$<br>$f(-5) = -6$      | 10. $j(5) = 3$<br>$j(x) = 3$<br>$j(5) = 3$                             | 11. $h(-1) = -2$<br>$h(x) = 2x$<br>$h(-1) = 2(-1)$<br>$h(-1) = -2$                                  | 12. $j(-3) = 7$<br>$j(x) = -2x+1$<br>$j(-3) = -2(-3)+1$<br>$j(-3) = 6+1$<br>$j(-3) = 7$              |
| 13. $g(9) = 3$<br>$g(x) = \sqrt{x}$<br>$g(9) = \sqrt{9}$<br>$g(9) = 3$ | 14. $g(1) = 1$<br>$g(x) = \sqrt{x}$<br>$g(1) = \sqrt{1}$<br>$g(1) = 1$ | 15. $h(4) = 5$<br>$h(x) = 5$<br>$h(4) = 5$  | 16. $j(5) = 11$<br>$j(x) = -2x+1$<br>$j(5) = -2(5)+1$<br>$j(5) = -10+1$<br>$j(5) = -9$               |
| 17. $f(4) = 8$<br>$f(x) = 2x$<br>$f(4) = 2(4)$<br>$f(4) = 8$           | 18. $h(-3) = -6$<br>$h(x) = 2x$<br>$h(-3) = 2(-3)$<br>$h(-3) = -6$     | 19. $j(2) = -3$<br>$j(x) = -2x+1$<br>$j(2) = -2(2)+1$<br>$j(2) = -4+1$<br>$j(2) = -3$               | 20. $g(-1) = 1$<br>$g(x) = \sqrt{-x}$<br>$g(-1) = \sqrt{-(-1)}$<br>$g(-1) = \sqrt{1}$<br>$g(-1) = 1$ |