

- _____ 17. For all real numbers x where $x > 1$, let $f(x) = \sqrt{\sqrt{x} - 1}$.
What is the value of $f(100)$?

$$\begin{aligned} & \sqrt{\sqrt{100} - 1} \\ & \sqrt{10 - 1} \\ & \sqrt{9} = 3 \end{aligned}$$

- _____ 18. According to the table above, for what value of x does $f(x) = x + 2$?
A. 0 B. 1 C. 2 D. 3 E. 4

x	$f(x)$
0	3 \times
1	4 \times
2	2 \times
3	5 \checkmark
4	8 \times

- _____ 19. If $f(x) = \sqrt{x+1}$ for all values of $x \geq 0$, and $f(x) = x^2 + 2$ for all values of $x < 0$, what is the sum of $f(-3)$ and $f(8)$?

$$f(-3) = (-3)^2 + 2 = 11$$

$$f(8) = \sqrt{8+1} = 3$$

$$14$$

20. Let the function g be defined by $g(x) = 5x + 2$.

If $\sqrt{g\left(\frac{a}{2}\right)} = 6$, what is the value of a ?

$$g\left(\frac{a}{2}\right) = 36$$

$$5\left(\frac{a}{2}\right) + 2 = 36$$

$$5\left(\frac{a}{2}\right) = 34$$

$$2 \cdot \frac{a}{2} = \frac{34}{5} \cdot 2$$

$$a = \frac{68}{5}$$

19. Let $f(a, b) = a^2 - b^2$. If $f(5, d) = 9$, what is the positive value of d ?

$$5^2 - d^2 = 9 \quad d^2 = 16$$

$$25 - d^2 = 9 \quad d = 4$$

$$-d^2 = -16$$

20. If $f(4) = 8$ and $f(5) = 17$, then which of the following could be $f(x)$?
~~A. $x + 4$~~ ~~B. $2x$~~ ~~C. $4x - 3$~~ ~~D. $x^2 - 2$~~ ~~E. $x^2 - 4$~~

21. If $f(g(a)) = 6$, $f(x) = \frac{x}{2} + 2$, and $g(x) = |x^2 - 10|$, which of the following is a possible value of a ?
 A. $\sqrt{2}$ B. $\sqrt{3}$ C. 2 D. 6 E. 18

$$\frac{|x^2 - 10|}{2} + 2 = 6$$

$$2 \cdot \frac{|x^2 - 10|}{2} = 4 \cdot 2$$

$$|x^2 - 10| = 8$$

$$x^2 - 10 = 8 \quad \text{OR} \quad x^2 - 10 = -8$$

$$\frac{x^2 - 10 + 10}{\sqrt{}} = \frac{18}{\sqrt{}} \quad \frac{x^2 - 10 + 10}{\sqrt{}} = \frac{-8}{\sqrt{}}$$

$$\sqrt{x^2} = \sqrt{18} \quad \sqrt{x^2} = \sqrt{2}$$

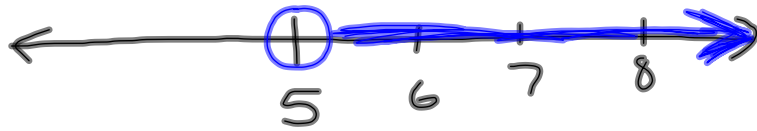
$$x = \sqrt{18} \quad x = \sqrt{2}$$

- _____ 22. If $f(2) = 10$ and $f(4) = 44$, which of the following could be $f(x)$?
A. $2x + 6$ B. $2x^2 + 12$ C. $2x^3 + 2$ D. $2x^3 - 4x$ E. $3x^2 - x$

3. For all x , let $f(x) = (10 - x)^2$. If $p = f(6)$, which of the following is equal to $4p$?
A. $f(24)$ B. $f(18)$ C. $f(12)$ D. $f(8)$ E. $f(4)$

$$(10 - 6)^2 = 16$$
$$p = 16$$
$$4 \cdot p = 4 \cdot 16$$
$$64$$
$$f(18) = (10 - 18)^2$$
$$(-8)^2$$
$$64$$

$$x > 5$$



Interval notation

$$(5, \infty)$$

(← doesn't include

[← includes

$$x \leq 10$$



$$(-\infty, 10]$$

$$x \geq -6$$

$$[-6, \infty)$$

$$2 < x \leq 6$$

$$(2, 6]$$

- _____ 17. For all real numbers x where $x > 1$, let $f(x) = \sqrt{\sqrt{x} - 1}$.
What is the value of $f(100)$?

$$\begin{aligned} &\sqrt{\sqrt{100} - 1} \\ &\sqrt{10 - 1} \\ &\sqrt{9} \\ &3 \end{aligned}$$

- _____ 18. According to the table above, for what value of x does $f(x) = x + 2$?
A. 0 B. 1 C. 2 D. 3 E. 4

x	$f(x)$	
0	3	X
1	4	X
2	2	X
3	5	✓
4	8	

- __ 19. If $f(x) = \sqrt{x+1}$ for all values of $x \geq 0$, and $f(x) = x^2 + 2$ for all values of $x < 0$, what is the sum of $f(-3)$ and $f(8)$?

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If $\sqrt{g\left(\frac{a}{2}\right)} = 6$, what is the value of a ?

$$g\left(\frac{a}{2}\right) = 36$$

$$5\left(\frac{a}{2}\right) + 2 = 36$$

$$5\left(\frac{a}{2}\right) = 34$$

$$2 \cdot \frac{a}{2} = \frac{34}{5} \cdot \frac{2}{1}$$

$$a = \frac{68}{5}$$

19. Let $f(a, b) = a^2 - b^2$. If $f(5, d) = 9$, what is the positive value of d ?

$$5^2 - d^2 = 9$$

$$25 - d^2 = 9$$

$$-d^2 = -16$$

$$d^2 = 16$$

$$d = 4$$

20. If $f(4) = 8$ and $f(5) = 17$, then which of the following could be $f(x)$?
 A. $x + 4$ B. $2x$ C. $4x - 3$ D. $x^2 - 2$ E. $x^2 - 4$

21. If $f(g(a)) = 6$, $f(x) = \frac{x}{2} + 2$, and $g(x) = |x^2 - 10|$, which of the following is a possible value of a ?
 A. $\sqrt{2}$ B. $\sqrt{3}$ C. 2 D. 6 E. 18

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$$2 \cdot \frac{|x^2 - 10|}{2} = 4 \cdot 2$$

$$|x^2 - 10| = 8$$

$$x^2 - 10 = 8 \quad \text{OR} \quad x^2 - 10 = -8$$

$$\frac{x^2 - 10 + 10}{\sqrt{x^2}} = \frac{18}{\sqrt{x^2}} \quad \frac{x^2 - 10 + 10}{\sqrt{x^2}} = \frac{-8}{\sqrt{x^2}}$$

$$x = \sqrt{18} \quad x = \sqrt{2}$$

- _____ 22. If $f(2) = 10$ and $f(4) = 44$, which of the following could be $f(x)$?
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$$f(2) = 3 \cdot 2^2 - 2 = 10 \quad ? \checkmark$$
$$f(4) = 3 \cdot 4^2 - 4 = 44 \quad \checkmark$$

3. For all x , let $f(x) = (10 - x)^2$. If $p = f(6)$, which of the following is equal to $4p$?
A. $f(24)$ B. $f(18)$ C. $f(12)$ D. $f(8)$ E. $f(4)$

$$f(6) = (10 - 6)^2 = 16 = p$$

$$4 \cdot 16 = 64$$

$$A.) f(24) = (10 - 24)^2 = 196$$

$$\checkmark B.) f(18) = (10 - 18)^2 = 64$$

Interval notation



$$4 < x \leq 7$$

$$(4, 7]$$

(← doesn't include

[← includes

$$x \geq 4$$



$$[4, \infty)$$

$$x \leq 9$$



$$(-\infty, 9]$$