

PRINTABLE VERSION

Quiz 1

You scored 100 out of 100

Question 1

Your answer is CORRECT.

Find the domain of the following function.

$$f(x) = \sqrt{7x - 4}$$

even

a) ☐ $(-\infty, 4/7)$

b) ☐ $(4/7, \infty)$

c) ☐ (∞, ∞)

d) ☒ $[4/7, \infty)$

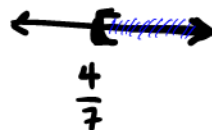
e) ☐ $(-\infty, 4/7]$

f) ☐ None of the above.

$$7x - 4 \geq 0$$

$$7x \geq 4$$

$$x \geq \frac{4}{7}$$



$$[4/7, \infty)$$

Question 2

Your answer is CORRECT.

Find the domain of the following function.

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

Radical

a) ☐ $[2, \infty)$

b) ☒ $[2, 6) \cup (6, \infty)$

c) ☐ $(-\infty, \infty)$

d) ☐ $(-\infty, 6) \cup (6, \infty)$

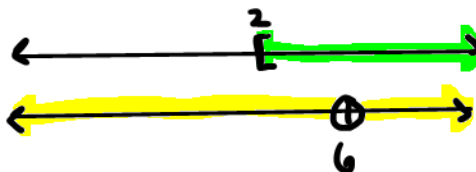
e) ☐ $(2, 6) \cup (6, \infty)$

$$x - 2 \geq 0$$

$$x \geq 2$$

$$x - 6 \neq 0$$

$$x \neq 6$$



$$[2, 6) \cup (6, \infty)$$

f) ☐ None of the above.

Question 3

Your answer is CORRECT.

If

$$f(x) = x^2 + 3x + 5$$

find

$$f(x-5)$$

a) ☐ $25x^2 - 15x + 5$

b) ☐ $x^2 + 3x + 10$

c) ☒ $x^2 - 7x + 15$

d) ☐ $x^2 + 13x + 45$

e) ☐ $x^2 + 3x$

f) ☐ None of the above.

$$\begin{aligned} f(x-5) &= (x-5)^2 + 3(x-5) + 5 \\ &= x^2 - 10x + 25 + 3x - 15 + 5 \\ &= x^2 - 7x + 15 \end{aligned}$$

Question 4

Your answer is CORRECT.

Given

$$f(x) = x^2 - 4x + 5$$

find the difference quotient

$$\frac{f(x+h) - f(x)}{h}, \quad h \neq 0$$

a) ☐ $\frac{x^2 + 2xh + h^2 - 4x - 3h + 5}{h}$

b) ☐ $-2x + h + 4$

c) ☐ $x^2 - 4x + h$

d) ☒ $2x + h - 4$

$$\begin{aligned} 1. & f(x+h) & \textcircled{1} & f(x+h) = (x+h)^2 - 4(x+h) + 5 \\ & & & = x^2 + 2hx + h^2 - 4x - 4h + 5 \\ 2. & f(x+h) - f(x) & \textcircled{2} & f(x+h) - f(x) \\ 3. & \frac{f(x+h) - f(x)}{h} & & = \cancel{x^2} + 2hx + h^2 - \cancel{4x} - 4h + \cancel{5} - (\cancel{x^2} - \cancel{4x} + \cancel{5}) \\ & & & = 2hx + h^2 - 4h \\ & & \textcircled{3} & \frac{f(x+h) - f(x)}{h} = \frac{2hx + h^2 - 4h}{h} \end{aligned}$$

$$= \frac{K(2x+h-4)}{K} = 2x+h-4$$

e) ☐ $\frac{x^2 + 2xh + h^2 - 4x - 4h + 5}{h}$

f) ☐ None of the above.

Question 5

Your answer is **CORRECT**.

Given

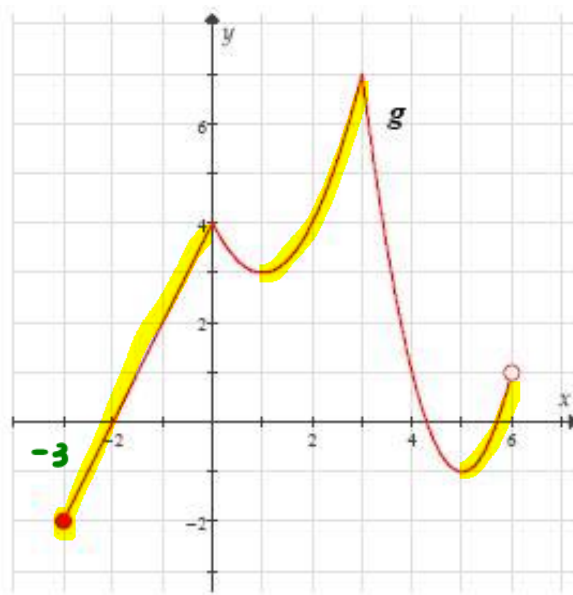
Domain: $[-3, 6)$

Range: $[-2, 7]$

$y : (0, 4)$

$\downarrow$
 $x=0$

$g(-2) = 0$



Inc:

$(-3, 0) \cup (1, 3)$

$\cup (5, 6)$

Which of the following statement(s) is true?

I. The domain of $g(x)$ is $[-3, 6)$. **T**

II. The range of $g(x)$ is $[-2, 7]$. **T**

III. The y -intercept of $g(x)$ is $(0, 0)$. **F**

IV. $g(-2) = 4$. **F**

V. $g(x)$ is increasing on the intervals $(-3, 0) \cup (1, 3) \cup (5, 6)$. **T**

a) ☐ None of these are true.

b) ☒ I II V

c) ☐ I II

d) ☐ I III IV

e) ☐ III IV

f) ☐ None of the above.

Question 6

Your answer is CORRECT.

Find the x - and y -intercepts of the following function.

$$f(x) = (x + 6)(x - 7)$$

$$f(x) = x^2 - x - 42$$

solve
 x -intercept $\rightarrow y=0$
 y -intercept $\rightarrow x=0$

a) ☐ x -intercepts: $(-6, 0)$ and $(-7, 0)$; y -intercept: $(0, -42)$

$$f(0) = -42$$

b) ☒ x -intercepts: $(-6, 0)$ and $(7, 0)$; y -intercept: $(0, -42)$

$$y\text{-intercept: } (0, -42)$$

c) ☐ x -intercept: $(-42, 0)$; y -intercept: $(0, 42)$

$$x\text{-intercept: } (-6, 0) \\ (7, 0)$$

d) ☐ x -intercepts: $(6, 0)$ and $(7, 0)$; y -intercept: $(0, -42)$ e) ☐ There are no x -intercept or y -intercepts.f) ☐ None of the above.

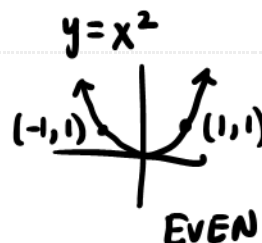
Question 7

Your answer is CORRECT.

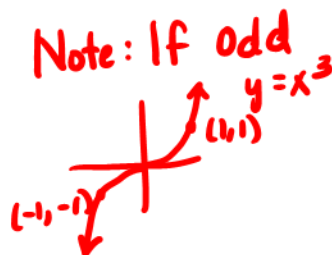
Suppose that $y = f(x)$ is an even function and that $(-2, -4)$ is a point on the graph of f . Which of the given points is also on the graph of $f(x)$?a) ☐ $(4, 2)$

EVEN (definition)

$$(x, y) \leftrightarrow (-x, y)$$

b) ☒ $(2, -4)$

$$(-2, -4) \leftrightarrow (2, -4)$$

c) ☐ $(2, 4)$ d) ☐ $(-4, -2)$ e) ☐ $(-2, 4)$ f) ☐ None of the above.

$$\text{ODD} \\ (x, y) \leftrightarrow (-x, -y) \\ (-2, -4) \leftrightarrow (2, 4)$$

Question 8

Your answer is CORRECT.

Determine whether the following function is even, odd, both or neither.

EVEN: $f(-x) = f(x)$

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

ODD: $f(-x) = -f(x)$

a) ☒ neither

$$\begin{aligned} f(-x) &= (-x)^5 + (-x)^3 - 3 \\ &= -x^5 - x^3 - 3 \neq f(x) \end{aligned}$$

b) ☐ both

c) ☐ odd

$$\begin{aligned} -f(x) &= -(x^5 + x^3 - 3) \\ &= -x^5 - x^3 + 3 \neq f(-x) \end{aligned}$$

NEITHER

d) ☐ even

e) ☐ None of the above.

Question 9

Your answer is **CORRECT**.

Describe how the graph of g is obtained from the graph of f .

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

$$g(x) = \left[\frac{2}{3} \right] (x + 5)^2 + 4$$

vertical stretch
4 up
5 left

a) ☐ Stretched vertically by a factor of $2/3$, vertical shift of 4 units downward, horizontal shift of 5 units to the left.

b) ☐ Stretched vertically by a factor of $2/3$, vertical shift of 5 units upward, horizontal shift of 4 units to the right.

c) ☐ Stretched vertically by a factor of $2/3$, vertical shift of 4 units upward, horizontal shift of 5 units to the right.

d) ☐ Stretched vertically by a factor of $2/3$, vertical shift of 5 units downward, horizontal shift of 4 units to the left.

e) ☒ Stretched vertically by a factor of $2/3$, vertical shift of 4 units upward, horizontal shift of 5 units to the left.

f) ☐ None of the above.

Question 10

Your answer is **CORRECT**.

State the translation of the key point (0, 0).

Parent: $\sqrt{x}$

$$f(x) = \sqrt{4-x} - 5$$

left
4

reflect
over y

down
5



1. Down 5, left 4

2. reflect over y

a) ☐ (4, 5)

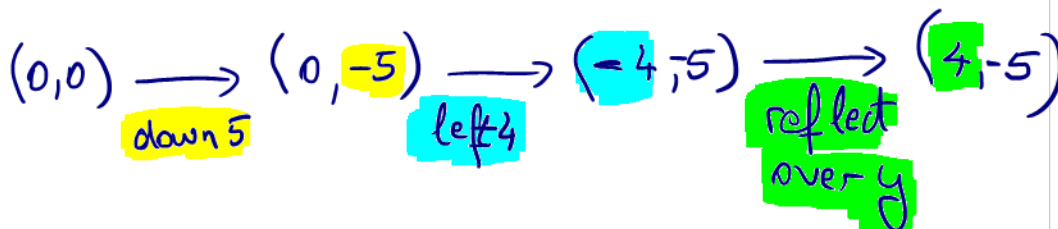
b) ☐ (-4, 5)

c) ☒ (-4, -5)

d) ☐ (-5, 4)

e) ☐ (4, -5)

f) ☐ None of the above.



Question 11

Your answer is CORRECT.

Suppose the point (2, 3) lies on the graph of the function $f(x)$. If the function is transformed as $2f(x - 4) + 3$, which of these will be the coordinates of (2, 3) under the transformation?

a) ☒ (-2, 9)

b) ☐ (6, 7)

c) ☐ (6, 9)

d) ☐ (-6, 3)

e) ☐ (2, 7)

f) ☐ None of the above.

Handwritten work for Question 11:

$$(2, 3) \xrightarrow{2f(x-4)+3} (2, 3(2)) = (2, 6)$$

$$(2, 6) \xrightarrow{\text{right 4}} (2+4, 6) = (6, 6)$$

$$(6, 6) \xrightarrow{\text{up 3}} (6, 6+3) = (6, 9)$$

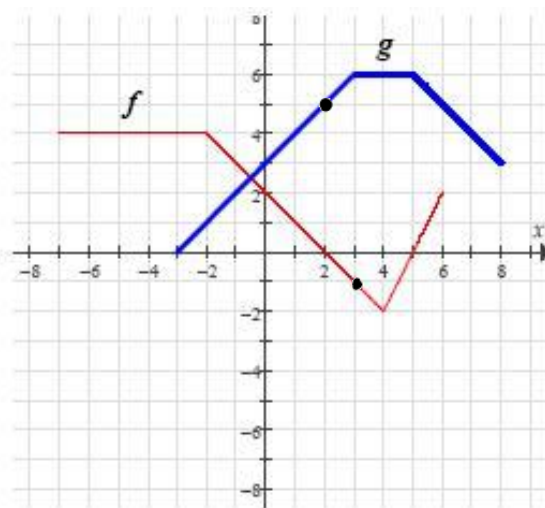
Question 12

Your answer is CORRECT.

Given the following graphs of f and g , find $f(3) + g(2)$.

$$f(3) + g(2)$$

$$-1 + 5 = \boxed{4}$$



- a) ☐ 6
- b) ☐ -7
- c) ☐ -6
- d) ☒ 4**
- e) ☐ 3
- f) ☐ None of the above.

Question 13

Your answer is CORRECT.

Given

$$f(x) = 6x^2 - 4x$$

and

$$g(x) = x^2 + x - 30$$

Find the domain of

$$\frac{f}{g}$$

- a) ☒ $(-\infty, -6) \cup (-6, 5) \cup (5, \infty)$**
- b) ☐ $(-\infty, -5) \cup (-5, 6) \cup (6, \infty)$
- c) ☐ $(-\infty, -6] \cup [5, \infty)$
- d) ☐ $(-\infty, -6) \cup (5, \infty)$

$$\frac{f(x)}{g(x)} = \frac{6x^2 - 4x}{x^2 + x - 30} = \frac{6x^2 - 4x}{(x-5)(x+6)}$$

$x \neq 5 \quad x \neq -6$

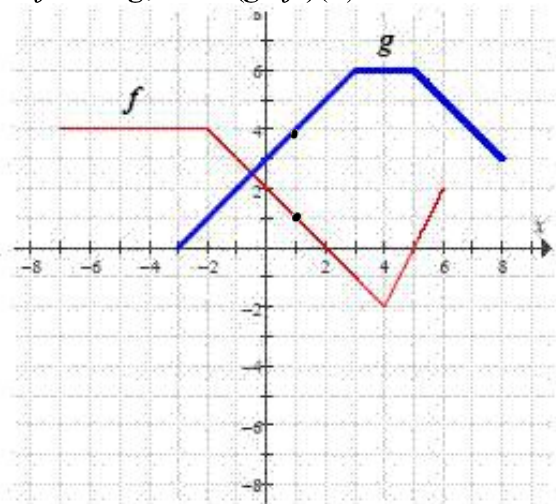
e) ☐ $(-\infty, 2/3) \cup (2/3, \infty)$

f) ☐ None of the above.

Question 14

Your answer is CORRECT.

Given the following graphs of f and g , find $(g \circ f)(1)$.



$$g \circ f(1)$$

$$g(f(1))$$

$$g(1) = 4$$

a) ☐ 5

b) ☐ -4

c) ☒ 4

d) ☐ 1

e) ☐ 2

f) ☐ None of the above.

Question 15

Your answer is CORRECT.

Given the following functions, find $g \circ f$.

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

$$g(x) = 6x - 4$$

$$g(f(x))$$

$$\uparrow$$

$$x^2 - x$$

$$g(f(x)) = 6(x^2 - x) - 4$$

$$= 6x^2 - 6x - 4$$

a) ☐ $72x^2 - 108x + 40$

- b) ☐ $36x^2 - 54x + 20$
- c) ☐ $12x^2 - 12x - 8$
- d) ☐ $x^2 - 7x + 4$
- e) ☒ $6x^2 - 6x - 4$
- f) ☐ None of the above.

Question 16

Your answer is CORRECT.

Given the following functions, find $f(g(-2))$.

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

$$g(x) = 5x - 3x^2$$

- a) ☐ -16
- b) ☐ -8
- c) ☐ -42
- d) ☒ -21**
- e) ☐ 21
- f) ☐ None of the above.

$$g(-2) = 5(-2) - 3(4)$$

$$= -10 - 12 = -22$$

$$f(-22) = -22 + 1 = -21$$

Question 17

Your answer is CORRECT.

Which of the following functions are one-to-one?

- I. $f(x) = 5x^2 + 4$ 
- II. $g(x) = 2(x+4)^2$ 
- III. $h(x) = 5|x| - 3$ 
- IV. $k(x) = 5\sqrt{x} - 5$ 

- a) ☐ I II
- b) ☐ None of these are one-to-one.
- c) ☒ IV
- d) ☐ I III IV
- e) ☐ I II III
- f) ☐ None of the above.

Question 18

Your answer is **CORRECT.**

Given the following table:

f :

x	$f(x)$
-6	2
5	3
-2	5

f^{-1} :

x	y
2	-6
3	5
5	-2

Handwritten notes: A red arrow points from the value 5 in the $f(x)$ column to the f^{-1} table. Below the arrow, $f^{-1}(5) = 2$ is written in red.

What is the value of $f^{-1}(5)$?

- a) ☒ -3
- b) ☐ 2
- c) ☒ -2
- d) ☐ -6
- e) ☐ 3
- f) ☐ None of the above.

Question 19

Your answer is **CORRECT.**

If f and g are inverse functions, $f(6) = 1$ and $f(-4) = 6$, find $g(6)$.

- a) ☒ -4

- b) ☐ -6
- c) ☐ 1
- d) ☐ Not enough information.
- e) ☒ -1
- f) ☐ None of the above.

$$f: \begin{array}{c|c} x & y \\ \hline 6 & 1 \\ -4 & 6 \end{array} \quad g: \begin{array}{c|c} x & y \\ \hline 1 & 6 \\ \rightarrow 6 & -4 \end{array}$$

$\Rightarrow g(6) = -4$

Question 20

Your answer is CORRECT.

Find the inverse of the given function, if possible.

$$f(x) = \frac{3 + 5x}{x - 4}$$

- a) ☐ $f^{-1}(x) = \frac{3x + 5}{x + 4}$
- b) ☐ $f^{-1}(x) = \frac{x - 4}{3 + 5x}$
- c) ☐ $f(x)$ does not have an inverse.
- d) ☐ $f^{-1}(x) = \frac{5x - 3}{x + 4}$
- e) ☒ $f^{-1}(x) = \frac{3 + 4x}{x - 5}$
- f) ☐ None of the above.

$$①. y = \frac{3+5x}{x-4}$$

$$②. \frac{x}{1} = \frac{3+5y}{y-4}$$

$$④. f^{-1}(x) = \frac{3+4x}{x-5}$$

$$③. x(y-4) = 3+5y$$

$$xy - 4x = 3 + 5y$$

$$xy - 5y = 3 + 4x$$

$$y(x-5) = 3 + 4x$$

$$y = \frac{3+4x}{x-5}$$

Question 21

Your answer is CORRECT.

Use the Property of Inverse Functions to determine which of the given functions are inverses of each other.

$$f(g(x)) = x$$

$$g(h(x)) = x$$

$$f(x) = 4x - 2$$

$$f\left(\frac{1}{2} + \frac{1}{4}x\right) \xleftarrow{g(x)}$$

$$= 4\left(\frac{1}{2} + \frac{1}{4}x\right) - 2$$

$$= 2 + x - 2$$

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

$$h(x) = -2 - \frac{1}{4}x$$

a) ☐ None of these are inverses of each other.

b) ☐ f and h

c) ☐ g and h

d) ☒ f and g

e) ☐ None of the above.

Question 22

Your answer is **CORRECT**.

Given the following function, find $f(-2p)$.

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

$$\begin{aligned} f(-2p) &= \frac{(-2p)^2}{-2p-3} - (-2p) \\ &= \frac{4p^2}{-2p-3} + 2p \end{aligned}$$

a) ☒ $\frac{4p^2}{-2p-3} + 2p$

b) ☐ $-\frac{4p^2}{-2p-3} + 2p$

c) ☐ $-\frac{2p^2}{-2p-3} + 2p$

d) ☐ $-\frac{4p^2}{-2p-3} - 2p$

e) ☐ $\frac{2p^2}{-2p-3} + 2p$

f) ☐ None of the above.

Your answer is CORRECT.

Given

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

$$1. f(x+h) = \frac{-1}{x+h+4}$$

Find the difference quotient

$$\frac{f(x+h) - f(x)}{h}, h \neq 0$$

$$2. f(x+h) - f(x)$$

$$= \frac{-1(x+4)}{(x+4)(x+h+4)} + \frac{1(x+h+4)}{(x+4)(x+h+4)}$$

$$= \frac{-x-4+x+h+4}{(x+h+4)(x+4)}$$

$$= \frac{h}{(x+h+4)(x+4)}$$

$$3. \frac{f(x+h) - f(x)}{h} = \frac{h}{(x+h+4)(x+4)} \cdot \frac{1}{h} = \frac{1}{(x+h+4)(x+4)}$$

a) ☐ $-\frac{9}{(x+h+4)(x+4)}$

b) ☒ $\frac{1}{(x+h+4)(x+4)}$

c) ☐ $-\frac{-8-h}{(x+h+4)h}$

d) ☐ $-\frac{1}{(x+h+4)(x+4)}$

e) ☐ $\frac{-8-h}{(x+h+4)(x+4)h}$

f) ☐ None of the above.

Question 24

Your answer is CORRECT.

Suppose

$$f(x) = -2x^2 - 7x - 5$$

Find the y-intercept of $f(x-2)$. $\overset{x=0}{\nearrow} = f(0-2) = f(-2) = \text{evaluate}$

a) ☐ -5

b) ☒ 1

c) ☐ -3

d) ☐ 5

e) ☐ -6

$$\begin{aligned} f(-2) &= -2(-2)^2 - 7(-2) - 5 \\ &= -2(4) + 14 - 5 \\ &= -8 + 14 - 5 \\ &= 1 \end{aligned}$$

Question 25

Your answer is CORRECT.

Find the linear function f with y -intercept 3 and $f^{-1}(0) = -1$. $\Leftrightarrow f(-1) = 0$

a) ☐ $f(x) = -3x + 3$

b) ☒ $f(x) = 3x + 3$

c) ☐ $f(x) = 3x - 3$

d) ☐ $f(x) = -3x - 1$

e) ☐ $f(x) = 3x - 1$

f) ☐ None of the above.

$\hookrightarrow x=0$
 $(0,3)$
 $f: (-1,0)$

point: $(0,3)$

slope: $\frac{\Delta y}{\Delta x} = \frac{0-3}{-1-0} = \frac{-3}{-1} = 3$

$$y - 3 = 3(x - 0)$$

$$y = 3x + 3$$