You scored 100 out of 100

Question 1
Your answer is CORRECT.

Find the domain of the following function.

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

a) (\(-\infty, \frac{4}{7}\))

b) (\(\frac{4}{7}, \infty\))

c) (\(\infty, \infty\))

d) [\(\frac{4}{7}, \infty\))

e) (\(-\infty, \frac{4}{7}\])

f) None of the above.

Question 2
Your answer is CORRECT.

Find the domain of the following function.

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

a) [\(2, \infty\))

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

c) (\(-\infty, \infty\))

d) (\(-\infty, 6) \cup (6, \infty\))

e) (2, 6) \cup (6, \infty)
f) None of the above.

Question 3

Your answer is CORRECT.

If

\[ f(x) = x^2 + 3x + 5 \]

find

\[ f(x - 5) \]

\[ f(x - 5) = (x - 5)^2 + 3(x - 5) + 5 \]

\[ = x^2 - 10x + 25 + 3x - 15 + 5 \]

\[ = x^2 - 7x + 15 \]

a) \[ 25x^2 - 15x + 5 \]

b) \[ x^2 + 3x + 10 \]

c) \[ x^2 - 7x + 15 \] **(Correct Answer)**

d) \[ x^2 + 13x + 45 \]

e) \[ x^2 + 3x \]

f) None of the above.

Question 4

Your answer is CORRECT.

Given

\[ f(x) = x^2 - 4x + 5 \]

find the difference quotient

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

\[ \frac{x^2 + 2xh + h^2 - 4x - 3h + 5}{h} \]

a) \[ x^2 + 2xh + h^2 - 4x - 3h + 5 \]

b) \[ -2x + h + 4 \]

1. \[ f(x + h) \]

2. \[ f(x + h) - f(x) \]

3. \[ \frac{f(x + h) - f(x)}{h} \]

\[ f(x + h) = (x + h)^2 - 4(x + h) + 5 \]

\[ = x^2 + 2hx + h^2 - 4x - 4h + 5 \]

\[ f(x + h) - f(x) = x^2 + 2hx + h^2 - 4x - 4h + 5 - (x^2 - 4x + 5) \]

\[ = 2hx + h^2 - 4h \]

\[ \frac{f(x + h) - f(x)}{h} = \frac{2hx + h^2 - 4h}{h} \]
\[
\frac{x^2 + 2xh + h^2 - 4x - 4h + 5}{h}
\]

\(\text{Question 5}\)

\(\text{Your answer is } \text{CORRECT.}\)

\(\text{Given}\)

\(\text{Domain: } [-3, 6)\)
\(\text{Range: } [-2, 7]\)
\(g(-2) = 0\)
\(y = (0, 4)\)
\(x = 0\)
\(\text{Inc: } (-3, 0) \cup (1, 3) \cup (5, 6)\)

Which of the following statement(s) is true?

I. The domain of \(g(x)\) is \([-3, 6)\). \(\text{T}\)
II. The range of \(g(x)\) is \([-2, 7]\). \(\text{T}\)
III. The \(y\)-intercept of \(g(x)\) is \((0, 0)\). \(\text{F}\)
IV. \(g(-2) = 4\). \(\text{F}\)
V. \(g(x)\) is increasing on the intervals \((-3, 0) \cup (1, 3) \cup (5, 6)\). \(\text{T}\)

\(\text{a) } \text{None of these are true.}\)
\(\text{b) } \text{I II V}\)
\(\text{c) } \text{I II}\)
\(\text{d) } \text{I III IV}\)
\(\text{e) } \text{III IV}\)
\(\text{f) } \text{None of the above.}\)
Question 6

Your answer is CORRECT.

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

\[ f(x) = (x + 6)(x - 7) \quad f(x) = x^2 - x - 42 \]

\[ \text{x-intercept} \rightarrow y=0 \quad \text{y-intercept} \rightarrow x=0 \]

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

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

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

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)

b) ○ (2, -4)

c) ○ (2, 4)

d) ○ (-4, -2)

e) ○ (-2, 4)

f) ○ None of the above.

Question 8

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

\[ f(-x) = f(x) \quad \text{EVEN} \]
\[ f(x) = \frac{5}{x} + \frac{3}{x^3} - 3 \]
\[ f(-x) = -x^5 - x^3 + 3 = -f(x) \quad \text{ODD} \]

\[ f(-x) = (-x)^5 + (-x)^3 - 3 \]
\[ = -x^5 - x^3 - 3 \neq f(x) \]

\[ f(x) = -(-x)^5 + (-x)^3 - 3 \]
\[ = -x^5 - x^3 + 3 \neq f(-x) \]

\[ \begin{array}{ccc}
\text{a)} & \text{neither} & \text{b)} \text{ both} \\
\text{c)} & \text{odd} & \text{d)} \text{ even} \\
\text{e)} & \text{None of the above} \\
\end{array} \]

**Question 9**

Your answer is CORRECT.

Describe how the graph of \( g \) is obtained from the graph of \( f \).

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

\[ \begin{array}{ccc}
\text{a)} & \text{Stretched vertically by a factor of 2/3, vertical shift of 4 units downward, horizontal shift of 5 units to the left.} \\
\text{b)} & \text{Stretched vertically by a factor of 2/3, vertical shift of 5 units upward, horizontal shift of 4 units to the right.} \\
\text{c)} & \text{Stretched vertically by a factor of 2/3, vertical shift of 4 units upward, horizontal shift of 5 units to the right.} \\
\text{d)} & \text{Stretched vertically by a factor of 2/3, vertical shift of 5 units downward, horizontal shift of 4 units to the left.} \\
\text{e)} & \text{Stretched vertically by a factor of 2/3, vertical shift of 4 units upward, horizontal shift of 5 units to the left.} \\
\text{f)} & \text{None of the above.} \\
\end{array} \]

**Question 10**

Your answer is CORRECT.
State the translation of the key point (0, 0).

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

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.

Question 12

Your answer is CORRECT.

Given the following graphs of \( f \) and \( g \), find \( f(3) + g(2) \).
\[ f(3) + g(2) \]
\[ -1 + 5 = 4 \]

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) \((-\infty, -6) \cup (5, \infty)\)
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 $g \circ f$.

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

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

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.

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:

\[
\begin{array}{c|c}
  x & f(x) \\
  \hline
  -6 & 2 \\
  5 & 3 \\
  -2 & 5 \\
\end{array}
\]

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 \( g(6) \).
Question 20

Find the inverse of the given function, if possible.

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

a) \( f^{-1}(x) = \frac{3 + 5x}{x - 4} \)

b) \( f^{-1}(x) = \frac{3 + 5x}{x - 4} \)

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.

Question 21

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

\[ f(g(x)) = x \]

\[ g(h(x)) = x \]

\[ f(x) = 4x - 2 \]

\[ f\left(\frac{1}{2} + \frac{1}{4}x\right) = 4\left(\frac{1}{2} + \frac{1}{4}x\right)^2 \]

\[ = 2 + x - 2 \]
\( h(f(x)) = x \)

\[
\begin{align*}
g(x) &= \frac{1}{2} + \frac{1}{4} x \\
h(x) &= -2 - \frac{1}{4} x
\end{align*}
\]

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 \( f(-2p) \).

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

\[
f(-2p) = \left(\frac{-2p}{-2p-3}\right)^2 - \left(\frac{-2p}{-2p-3}\right)
\]

\[
= \frac{4p^2}{-2p-3} + 2p
\]

a)

\[
= \frac{4p^2}{-2p-3} + 2p
\]

b)

\[
= \frac{4p^2}{-2p-3} + 2p
\]

c)

\[
= \frac{4p^2}{-2p-3} - 2p
\]

d)

\[
= \frac{2p^2}{-2p-3} + 2p
\]

e)

\[
= \frac{-4p^2}{-2p-3} + 2p
\]

f) None of the above.
Your answer is CORRECT.

Given
\[ f(x) = -\frac{1}{x + 4} \]

Find the difference quotient
\[ \frac{f(x+h) - f(x)}{h} , \quad h \neq 0 \]

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

a) \[ -\frac{9}{(x+h+4)(x+4)} \]
b) \[ \frac{1}{(x+h+4)(x+4)} \]
c) \[ -\frac{8-h}{h} \]
d) \[ -\frac{1}{(x+h+4)(x+4)} \]
e) \[ -\frac{8-h}{h} \]
f) None of the above.

Question 24

Your answer is CORRECT.

Suppose
\[ f(x) = -2x^2 - 7x - 5 \]

Find the y-intercept of \( f(x-2) \).
\[ f(0) = f(-2) = \text{evaluate} \]

a) -5
b) 1

c) -3
d) 5
e) -6
**Question 25**

Your answer is CORRECT.

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

<table>
<thead>
<tr>
<th>Option</th>
<th>Equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>( f(x) = -3x + 3 )</td>
</tr>
<tr>
<td>b)</td>
<td>( f(x) = 3x + 3 )</td>
</tr>
<tr>
<td>c)</td>
<td>( f(x) = 3x - 3 )</td>
</tr>
<tr>
<td>d)</td>
<td>( f(x) = -3x - 1 )</td>
</tr>
<tr>
<td>e)</td>
<td>( f(x) = 3x - 1 )</td>
</tr>
<tr>
<td>f)</td>
<td>None of the above.</td>
</tr>
</tbody>
</table>

\[ f : (-1, 0) \]

Point: \( (0, 3) \)

Slope: \[ \frac{\Delta y}{\Delta x} = \frac{0 - 3}{-1 - 0} = \frac{-3}{-1} = 3 \]

\[ y - 3 = 3(x - 0) \]

\[ y = 3x + 3 \]