MATH 30-1, TRANSFORMATIONS, OPERATIONS & INVERSE FUNCTIONS, 25 QUESTIONS · 25 QUESTIONS

Transformations, Operations & Inverse Functions — Practice Test

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, use the Flag a mistake button to let Brett know so he can fix it.

1 **The point (-2, 5) lies on the graph of y = f(x). The image of this point on the graph of y = f(x + 3) - 4 is**

- A (-5, 1)
- B (1, 1)
- C (-5, 9)
- D (1, 9)

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2 **The graph of $f(x) = (x + 2)^2 - 3$ is transformed into the graph of $g(x) = f(x - 5) + 4$. The coordinates of the vertex on the graph of $y = g(x)$ are**

- **A** (-7, 1)
- **B** (3, 1)
- **C** (3, -7)
- **D** (-7, -7)

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3 **Compared to the graph of $y = f(x)$, the graph of $y = -\frac{1}{2}f(x)$ has been**

- **A** reflected in the y-axis and vertically stretched by a factor of $\frac{1}{2}$
- **B** reflected in the x-axis and vertically stretched by a factor of 2
- **C** reflected in the x-axis and vertically stretched by a factor of $\frac{1}{2}$
- **D** reflected in the y-axis and vertically stretched by a factor of 2

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4 The domain of $y = f(x)$ is $-3 \leq x \leq 5$. The domain of $y = f(x - 4) + 2$ is

- **A** $-7 \leq x \leq 1$
- **B** $-3 \leq x \leq 5$
- **C** $-1 \leq x \leq 7$
- **D** $1 \leq x \leq 9$

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5 The point $(6, -4)$ lies on the graph of $y = f(x)$. The corresponding point on the graph of the inverse, $y = f^{-1}(x)$, is

- **A** $(6, 4)$
- **B** $(-4, 6)$
- **C** $(-6, -4)$
- **D** $(4, -6)$

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6 **Given $f(x) = 2x - 3$ and $g(x) = x^2 + 1$, the value of $(f \circ g)(2)$ is**

- **A** 7
- **B** 2
- **C** 6
- **D** 5

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7 **Given $f(x) = 3x + 2$ and $g(x) = x^2 - 4$, an expression for $(g \circ f)(x)$ is**

- **A** $3x^2 - 10$
- **B** $9x^2 + 12x + 8$
- **C** $9x^2 - 12x$
- **D** $9x^2 + 12x$

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8 **Given $f(x) = x^2 + 3x$ and $g(x) = x - 2$, the value of $(f \circ g)(4)$ is**

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9 **The point (4, 6) lies on the graph of $y = f(x)$. The image of this point on the graph of $y = -f(2x)$ is**

A (4, -6)

B (8, -6)

C (2, -6)

D (2, 6)

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10 The inverse of the function $f(x) = \frac{x - 7}{2}$ is

- **A** $f^{-1}(x) = \frac{x + 7}{2}$
- **B** $f^{-1}(x) = 2x + 7$
- **C** $f^{-1}(x) = 2x - 7$
- **D** $f^{-1}(x) = \frac{x - 7}{2}$

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11 The domain of $y = f(x)$ is $-4 \leq x \leq 2$. The domain of $y = f(2x + 6)$ is

- **A** $-5 \leq x \leq -2$
- **B** $2 \leq x \leq 5$
- **C** $-2 \leq x \leq 1$
- **D** $-8 \leq x \leq -5$

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12 **The point (2, -5) lies on the graph of y = f(x). On the graph of y = -3f(x - 4), the y-coordinate of the image of this point is**

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13 **The graph of y = f(x), where f(x) = (x - 1)² + 1, is reflected in the line y = x. The number of invariant points is**

A 1

B 3

C 0

D 2

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14 **A restriction on the domain of $f(x) = (x - 3)^2 + 2$ that would ensure the inverse of $y = f(x)$ is a function is**

- **A** $x \geq 3$
- **B** $x \geq 2$
- **C** $x \leq 4$
- **D** $x \geq -3$

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15 **Given $f(x) = x^2 + 4x - 1$ and $g(x) = 2x^2 - 3$, an expression for $(f - g)(x)$ is**

- **A** $3x^2 + 4x - 4$
- **B** $-x^2 + 4x - 4$
- **C** $-x^2 + 4x + 2$
- **D** $x^2 - 4x - 2$

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16 **If $f(x) = 2x^2 - x + 3$ and $g(x) = x - 1$, then $(f \circ g)(x)$ can be written in the form $ax^2 + bx + c$. The value of $a + b + c$ is**

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17 **Given the function $f(x) = 5x - 20$, the y-intercept of the graph of $y = f^{-1}(x)$ is**

A -20

B 4

C -4

D 20

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18 **The range of $y = f(x)$ is $-2 \leq y \leq 6$. If $g(x) = -f(x) + 3$, then the maximum value of $g(x)$ is**

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19 **The graph of $y = x^2$ is vertically stretched by a factor of 2, reflected in the x-axis, translated 3 units to the left, and translated 1 unit up. The equation of the resulting graph is**

A $y = -2(x + 3)^2 + 1$

B $y = -2(x - 3)^2 + 1$

C $y = 2(x + 3)^2 - 1$

D $y = -\frac{1}{2}(x + 3)^2 + 1$

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20 **The point (8, -4) lies on the graph of $y = f(x)$. The graph is stretched horizontally about the y-axis by a factor of 3 and reflected in the x-axis. The x-coordinate of the image of this point is**

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21 The domain of $y = f(x)$ is $-1 \le x \le 7$. The domain of $y = f(-2x - 4)$ is

A $\frac{3}{2} \le x \le \frac{11}{2}$

B $-\frac{3}{2} \le x \le \frac{11}{2}$

C $-\frac{11}{2} \le x \le -\frac{3}{2}$

D $-\frac{11}{2} \le x \le \frac{3}{2}$

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22 Given $f(x) = x - 3$, $g(x) = 2x + 1$, and $h(x) = x^2$, the value of $(f \circ g \circ h)(2)$ is

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23 Given f(x) = x + 3 and g(x) = x - 2, an expression for (fg)(x) is

- **A** $x^2 + 5x - 6$
- **B** $x^2 + x + 6$
- **C** $x^2 - 5x - 6$
- **D** $x^2 + x - 6$

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24 The point (-4, 9) lies on the graph of y = f(x) and is mapped to a new point
using the mapping notation (x, y) → (2x + 1, -y - 3). The sum of the coordinates
of the image point is

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25 **The range of y = f(x) is -1 ≤ y ≤ 4. The range of y = -2f(x - 3) + 7 is**

A -15 ≤ y ≤ 1

B -1 ≤ y ≤ 15

C -9 ≤ y ≤ 9

D -1 ≤ y ≤ 9

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ANSWER KEY

1.	A	**10.**	B	**19.**	A
2.	B	**11.**	A	**20.**	24
3.	C	**12.**	15	**21.**	C
4.	D	**13.**	D	**22.**	6
5.	B	**14.**	A	**23.**	D
6.	A	**15.**	C	**24.**	-19
7.	D	**16.**	3	**25.**	D
8.	10	**17.**	B		
9.	C	**18.**	5		

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