Multiple choice questions - Functions and graph transformations

Year: Year 11 · 10

Question 1 (Higher) $f(x) = 4x - 1$. What is $f(3)$?

- ◯ **A.** 11
- ◯ **B.** 12
- ◯ **C.** 13
- ◯ **D.** 10

Question 2 (Higher) $f(x) = x + 2$, $g(x) = 3x$. What is $fg(x)$?

- ◯ **A.** $3x + 2$
- ◯ **B.** $3x + 6$
- ◯ **C.** $3x^2 + 2$
- ◯ **D.** $4x + 2$

Question 3 (Higher) $f(x) = x + 2$, $g(x) = 3x$. What is $gf(x)$?

- ◯ **A.** $3x + 2$
- ◯ **B.** $3x + 6$
- ◯ **C.** $x + 6$
- ◯ **D.** $3x$

Question 4 (Higher) What is the inverse of $f(x) = 2x + 6$?

- ◯ **A.** $\frac{x - 6}{2}$
- ◯ **B.** $\frac{x}{2} - 6$
- ◯ **C.** $2x - 6$
- ◯ **D.** $\frac{1}{2x + 6}$

Question 5 (Higher) The graph of $y = f(x + 4)$ is the graph of $y = f(x)$ translated by

- ◯ **A.** $\begin{pmatrix} 4 \\ 0 \end{pmatrix}$
- ◯ **B.** $\begin{pmatrix} 0 \\ 4 \end{pmatrix}$
- ◯ **C.** $\begin{pmatrix} -4 \\ 0 \end{pmatrix}$

- **D.** $\begin{pmatrix} 0 \\ -4 \end{pmatrix}$

Question 6 (Higher) $y = -f(x)$ is a reflection of $y = f(x)$ in

- **A.** the y-axis
- **B.** the x-axis
- **C.** the line $y = x$
- **D.** the origin only

Question 7 (Higher) Which graph never goes below the x-axis?

- **A.** $y = x^3$
- **B.** $y = \sin x$
- **C.** $y = 2^x$
- **D.** $y = \frac{1}{x}$

Question 8 (Higher) $f(x) = x^2$, $g(x) = x - 1$. What is $fg(4)$?

- **A.** 15
- **B.** 9
- **C.** 7
- **D.** 17

Question 9 (Higher) The graph of $y = \cos x$ has a maximum value of

- **A.** 0
- **B.** 1
- **C.** 90
- **D.** 360

Question 10 (Higher) The graph of $y = f(x)$ has a minimum at $(3, -1)$. Where is the minimum of $y = f(x) + 2$?

- **A.** $(3, 1)$
- **B.** $(5, -1)$
- **C.** $(3, -3)$
- **D.** $(1, -1)$

Answer grid - Functions and graph transformations

Year: Year 11

Question	Answer	Explanation
1	**A**	4(3)-1=11.
2	**A**	g first: 3x, then add 2.
3	**B**	f first: x+2, then multiply by 3 gives 3x+6.
4	**A**	x=(y-6)/2.
5	**C**	Inside the bracket: opposite direction, 4 left.
6	**B**	Changing the sign of y flips the graph in the x-axis.
7	**C**	Exponential growth with a positive base is always positive.
8	**B**	g(4)=3, f(3)=9.
9	**B**	cos x oscillates between -1 and 1.
10	**A**	Add 2 to the y coordinate.