

QUIZ 2

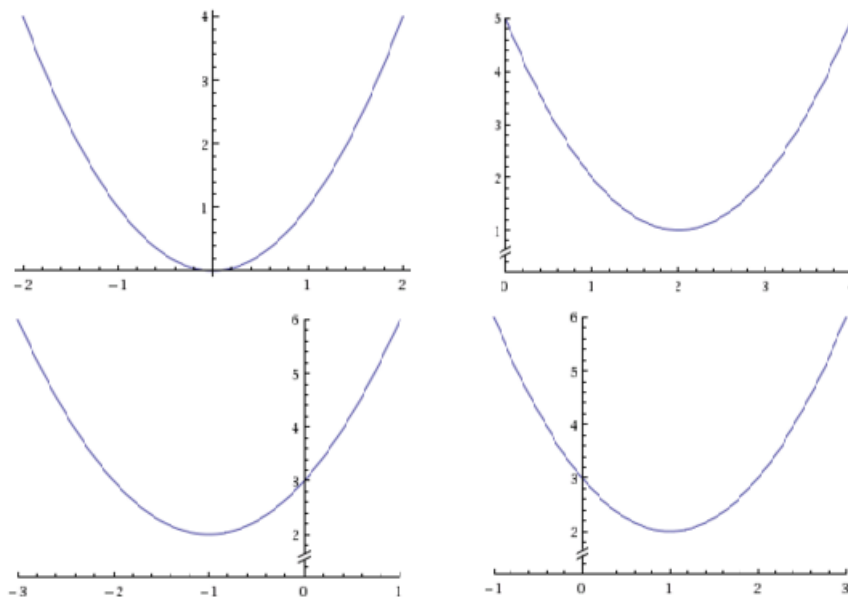
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Time: 15 minutes

Problem 1. If $f(1) = 3$, $f(2) = 4$, $g(1) = 2$, $g(3) = 2$, what is $(f \circ g)(1) - (g \circ f)(1)$?

- (a) 2 (b) -2 (c) 8 (d) 0 (e) π

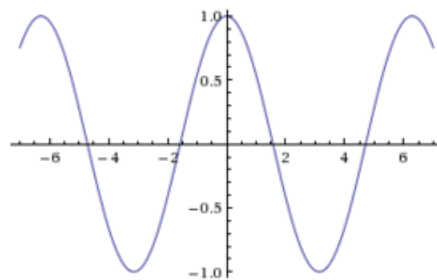
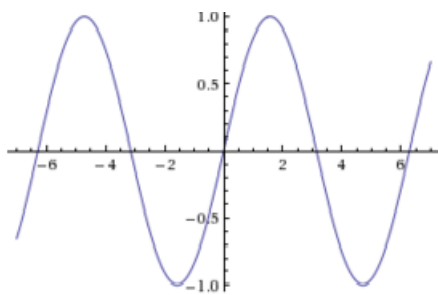
Problem 2. Which of the following graphs most closely resemble the curve $y = (x - 1)^2 + 2$?



Problem 3. Which of the following functions has a graph which can be obtained from $y = x^3$ by shifting to the RIGHT 1 unit, then reflecting about the x -axis?

- (a) $y = -x^3 + 1$ (b) $y = -(x - 1)^3$ (c) $y = (-x - 1)^3$ (d) $y = -x^3 - 1$

Problem 4. Recall that the graphs of $\sin x$ and $\cos x$ are related by a horizontal shift, as you can see in the diagrams below. Which of the given identities is true?



- (a) $\sin x = -\cos(x)$ (b) $\sin x = \cos(x - \frac{\pi}{2})$ (c) $\sin x = \cos(x + \frac{\pi}{2})$
 (d) $\sin x = \cos(x - \pi)$ (e) $\sin x = \cos(x) - \pi$

Problem 5. Compute $\log_4(16)$.

- (a) 0 (b) 1 (c) 2 (d) 3 (e) 4

Problem 6. Using the properties of logarithms

$$\log(a \cdot b) = \log a + \log b \qquad c \cdot \log b = \log(b^c),$$

compute $\ln(e^e \cdot e^3) - e$.

- (a) $3 - e$ (b) 3 (c) $2e$ (d) $-e$ (e) 0

Problem 7. (BONUS) Compute $\log_8(2)$.

- (a) 2 (b) 1 (c) $\frac{1}{2}$ (d) $\frac{1}{3}$ (e) 3

Problem 8. Sketch the graph of the piecewise function:

$$f(x) = \begin{cases} 1 & x < -1 \\ x^2 & -1 \leq x \leq 1 \\ x & x > 1 \end{cases}$$

Problem 9. Sketch the graph of the piecewise function:

$$g(x) = \begin{cases} -1 & x < -1 \\ x^3 & -1 \leq x \leq 1 \\ -x & x > 1 \end{cases}$$