

AP Calculus
Composition of Functions

Name _____

Date _____

1. Suppose $f(x) = 7x^2 - 3$ and $g(x) = 9 - 2x$. Find $(g \circ f)(x)$.

a) $60 - 14x$

b) $15 - 14x^2$

c) $564 - 252x + 28x^2$

d) $7x^2 - 2x + 6$

e) $63x^2 + 6x - 27$

2. Suppose $f(x) = 2x^2 - 5$ and $g(x) = 8 - 3x$. Find $(g \circ f)(x)$.

a) $-7 - 6x^2$

b) $23 - 6x^2$

c) $23 + 6x^2$

d) $18x^2 - 96x + 123$

e) $18x^2 + 96x + 123$

3. Suppose $f(x) = x - 2$ and $g(x) = \frac{x+5}{3}$. Find $(g \circ f)(x)$.

a) $x + 1$

b) $\frac{x-1}{3}$

c) $\frac{x+3}{3}$

d) $\frac{x^2 + 3x - 10}{3}$

e) $\frac{x-2}{3}$

4. Suppose $f(x) = x + 7$ and $g(x) = \frac{x-3}{8}$. Find $(g \circ f)(x)$.

a) $x + 1$

b) $\frac{x-53}{8}$

c) $\frac{x+4}{8}$

d) $\frac{x^2 + 3x - 28}{8}$

e) $x - 53$

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5. If $f(x) = 2x^2 + 1$ and $g(x) = x - 2$, then $(f \circ g)(x) =$

- a) $x^2 - 7$ b) $2x^2 + x - 1$ c) $2x^2 - 1$ d) $2x^2 - 8x + 9$ e) $2x^2 - 4x - 2$

6. If $f(x) = 2x^2 + 1$ and $g(x) = x + 2$, then $(f \circ g)(x) =$

- a) $2x^2 + 5$ b) $2x^2 + 3$ c) $2x^2 + 4x + 5$ d) $2x^2 + 8x + 9$ e) $2x^2 + 4x + 2$

7. Suppose $f(x) = \frac{1}{\sqrt{x}}$ and $g(x) = 1 - x^2$. Find $f(g(x))$.

- a) $\frac{1 - x^2}{\sqrt{x}}$ b) $\frac{1}{\sqrt{1 - x^2}}$ c) $1 - \frac{1}{x}$ d) $\frac{1}{\sqrt{x}} + 1 - x^2$ e) $\frac{1 - x}{\sqrt{x}}$

8. If $f(x) = \frac{1}{\sqrt{x}}$ and $g(x) = x^2 - 5$, then $g(f(x)) =$

- a) $\frac{1}{x} - 5$ b) $\frac{x - 5}{x}$ c) $\frac{1}{x} - \frac{1}{5}$ d) $\frac{1}{\sqrt{x^2 - 5}}$ e) $\frac{1}{x} - \frac{1}{\sqrt{5}}$

9. If $g(f(x)) = 9 - 6x$, $f(x) = 3x - 2$, and $g(x) = ax + b$, then $g(x) =$ _____

- a) $21 - 18x$ b) $21 - 12x$ c) $10 - 2x$ d) $10 - x$ e) $5 - 2x$

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10. If $f(g(x)) = x$, $f(x) = e^x$, and $x \geq 0$, then $g(x) =$

- a) x^e b) e^x c) $\frac{1}{e}$ d) $\frac{e}{\ln x}$ e) $\ln x$

11. Given $f(x) = x^3$ and $g(x) = x - 3$, find:

- a) $f \circ g$
b) $g \circ f$
c) $f \circ f$
d) $g \circ g$

12. Let $f(x) = 4x - 12$ and $g(x) = x^2 - 9$. Find $\left(\frac{f}{g}\right)(x)$.

- a) $\frac{4}{x-2}$ b) $\frac{4}{x-3}$ c) $\frac{4}{x+3}$ d) $\frac{4}{(x-3)(x+3)}$ e) $\frac{4(x-3)}{x+3}$

13. Solve: $2x^3 - 6x^2 > 0$

- a) $(-\infty, 0)$ or $(3, \infty)$ b) $(-\infty, 3)$ or $(3, \infty)$ c) $(-\infty, 0)$
d) $(3, \infty)$ e) $(0, 3)$

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14. Solve for x : $-x^2 + 5x + 6 < 0$

- a) $(-\infty, -1)$ or $(6, \infty)$ b) $(-\infty, -3)$ or $(2, \infty)$ c) $(-6, 1)$
d) $(-\infty, -6)$ or $(1, \infty)$ e) $(-\infty, -2)$ or $(3, \infty)$

15. Given $f(x) = 2x - 9$, find $f(3x)$.

- a) $2x - 27$ b) $2x - 9$ c) $8x - 9$ d) $8x - 27$ e) $6x - 9$

16. If $f(x) = 3x - 6$, what is the value of $f(\frac{1}{3}x)$?

- a) $-6x$ b) $x + 6$ c) $x - 6$ d) $x + 2$ e) $x - 2$

17. Given $f(x) = 2x - 3$, find the value of $f(f(2))$.

- a) -3 b) -2 c) -1 d) 1 e) 2

18. If $f(x) = 5x - 2$ and $g(x) = 2 - x$, what is the value of $f(g(x - 2))$?

- a) $18 - 5x$ b) $5x - 14$ c) $5x - 8$ d) $14 - 5x$ e) $5x - 18$

19. Given $h(x) = x^2 - 3x - 1$, what is $h(2x)$?

- a) $2x^2 - 6x - 2$ b) $x^2 - 6x - 1$ c) $4x^2 - 6x - 1$ d) $4x^2 - 12x - 1$ e) $4x^2 - 12x - 2$

1.
Answer: b
CodePath: EAS.APC.B.C.7

2.
Answer: b
CodePath: EAS.APC.B.C.8

3.
Answer: c
CodePath: EAS.APC.B.C.9

4.
Answer: c
CodePath: EAS.APC.B.C.10

5.
Answer: d
CodePath: EAS.APC.B.C.11

6.
Answer: d
CodePath: EAS.APC.B.C.12

7.
Answer: b
CodePath: EAS.APC.B.C.13

8.
Answer: a
CodePath: EAS.APC.B.C.15

9.
Answer: e
CodePath: EAS.APC.B.C.17

10.
Answer: e
CodePath: EAS.APC.B.C.20

11.
Answer: $(x - 3)^3, x^3 - 3, x^6, x - 6$
CodePath: EAS.APC.B.C.28

12.
Answer: c
CodePath: EAS.APC.B.C.4

13.
Answer: d
CodePath: EAS.APC.A.A.8

14.
Answer: a
CodePath: EAS.APC.A.A.10

15.
Answer: e
CodePath: EAS.SAT.G.B.3

16.
Answer: c
CodePath: EAS.SAT.G.B.6

17.
Answer: c
CodePath: EAS.SAT.G.B.9

18.
Answer: a
CodePath: EAS.SAT.G.B.15

19.
Answer: c
CodePath: EAS.SAT.G.B.21