

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Combining Functions Practice**

Given the functions  $f(x) = 3x^2 + 5x - 8$  and  $g(x) = 2x^2 + 4x - 9$

1. Find  $f(x) + g(x)$

$$(3x^2 + 5x - 8) + (2x^2 + 4x - 9)$$

Combine like terms

$$5x^2 + 9x - 17$$

2. Find  $g(x) - f(x)$

$$(2x^2 + 4x - 9) - (3x^2 + 5x - 8)$$

Distribute negative sign then combine like terms

$$2x^2 + 4x - 9 - 3x^2 - 5x + 8$$

$$-x^2 - x - 1$$

3. Find  $f(2) + g(2)$

Substitute 2 into f and substitute 2 into g, then add the resulting values

$$f(2) = 3(2)^2 + 5(2) - 8$$

$$3(4) + 5(2) - 8$$

$$12 + 10 - 8$$

$$= 14$$

$$g(2) = 2(2)^2 + 4(2) - 9 = 7 \rightarrow 14 + 7 = 21$$

4. Find  $2f(x) - g(x)$

distribute 2 to f(x) then subtract

$$2(3x^2 + 5x - 8) - (2x^2 + 4x - 9)$$

$$6x^2 + 10x - 16 - 2x^2 - 4x + 9$$

$$4x^2 + 6x - 7$$

Given the functions  $f(x) = 2x^2 + 3x - 5$  and  $g(x) = x^2 + 5x$  and  $h(x) = 3x^2$

$$4x^4 + 26x^3 + 20x^2 - 50x$$

5. Find  $h(x) \cdot g(x)$

$$3x^2(x^2 + 5x)$$

$$3x^4 + 15x^3$$

6. Find  $\frac{f(x)}{g(x)}$

$$\frac{2x^2 + 3x - 5}{x^2 + 5x}$$

6. Find  $2g(x) \cdot f(x)$

$$2(x^2 + 5x) \cdot (2x^2 + 3x - 5)$$

$$(2x^2 + 10x)(2x^2 + 3x - 5)$$

$$4x^4 + 6x^3 - 10x^2 + 20x^3 + 30x^2 - 50x$$

8. Find  $\frac{g(x)}{h(x)}$

$$\frac{x^2 + 5x}{3x^2}$$

GCF

$$\frac{x(x+5)}{3x^2}$$

$$\rightarrow \frac{x+5}{3x}$$

9. Find  $h(g(x))$

OMG

10. Find  $f(-1)$

$$2(-1)^2 + 3(-1) - 5$$

$$2(1) + 3(-1) - 5$$

$$2 - 3 - 5$$

$$-6$$

11. Find  $g(-3)$

$$(-3)^2 + 5(-3)$$

$$9 + -15$$

$$-6$$

12. Find  $h(g(f(1)))$

$$\underbrace{\underbrace{0}_0}_0$$

13. Find  $f(2) - g(3)$

$$f(2) = 2(2)^2 + 3(2) - 5$$

$$2(4) + 6 - 5$$

$$8 + 6 - 5$$

$$14 - 5$$

$$9$$

$$g(3) = 3^2 + 5(3)$$

$$9 + 15$$

$$24$$

$$9 - 24 = -15$$

14. Find  $h(g(-2))$

EVALUATE  $g(-2)$  first

$$(-2)^2 + 5(-2)$$

$$4 + -10$$

then evaluate  $h(-6)$

$$h(-6) = 3(-6)^2 \rightarrow 3(36) = 108$$

**DOT-TO-DOT PUZZLE**

1. Work each exercise.
2. Find the dot by each answer and connect the dots in order.

**Exercises**

Use the functions below to work each exercise.

$f(x) = x + 6$

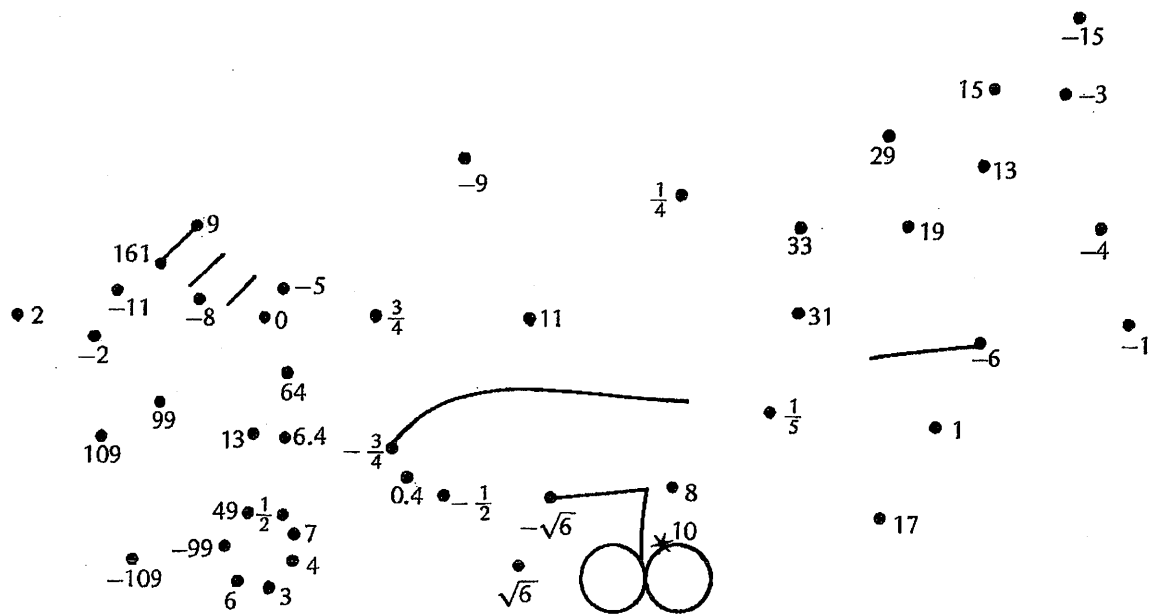
$g(x) = x^2 - 1$

$h(x) = 3x + 4$

$k(x) = 2x^2 - 4x + 1$

$p(x) = -x$

- |                |              |                       |
|----------------|--------------|-----------------------|
| 1. $f(4) = 10$ | 11. $f(-11)$ | 21. $f(0)$            |
| 2. $g(3)$      | 12. $g(1)$   | 22. $g(2)$            |
| 3. $h(-1)$     | 13. $h(-4)$  | 23. $h(0)$            |
| 4. $k(1)$      | 14. $k(10)$  | 24. $k(3)$            |
| 5. $p(6)$      | 15. $p(11)$  | 25. $p(-\frac{1}{2})$ |
| 6. $f(-9)$     | 16. $f(-8)$  | 26. $f(0.4)$          |
| 7. $g(-4)$     | 17. $g(-10)$ | 27. $g(\frac{1}{2})$  |
| 8. $h(5)$      | 18. $h(3)$   | 28. $h(-1.2)$         |
| 9. $k(-3)$     | 19. $k(6)$   | 29. $k(\frac{1}{2})$  |
| 10. $p(-9)$    | 20. $p(99)$  | 30. $p(\sqrt{6})$     |



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**Exercises**

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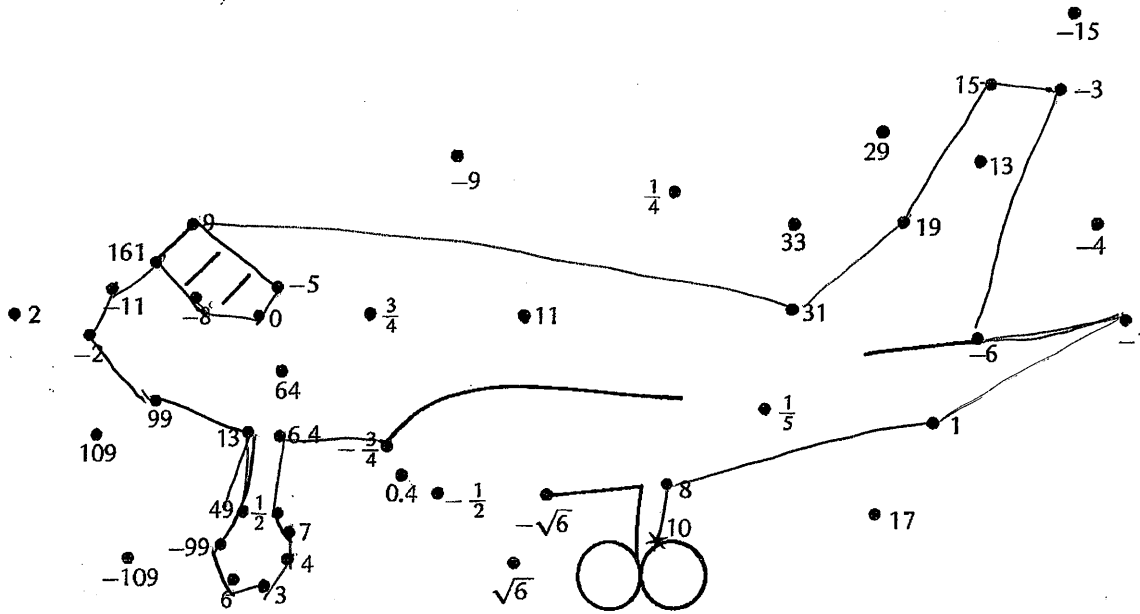
$g(x) = x^2 - 1$

$h(x) = 3x + 4$

$k(x) = 2x^2 - 4x + 1$

$p(x) = -x$

- |                 |                   |                                     |
|-----------------|-------------------|-------------------------------------|
| 1. $f(4) = 10$  | 11. $f(-11) = -5$ | 21. $f(0) = 6$                      |
| 2. $g(3) = 8$   | 12. $g(1) = 0$    | 22. $g(2) = 3$                      |
| 3. $h(-1) = 1$  | 13. $h(-4) = -8$  | 23. $h(0) = 4$                      |
| 4. $k(1) = -1$  | 14. $k(10) = 161$ | 24. $k(3) = 7$                      |
| 5. $p(6) = -6$  | 15. $p(11) = -11$ | 25. $p(-\frac{1}{2}) = \frac{1}{2}$ |
| 6. $f(-9) = -3$ | 16. $f(-8) = -2$  | 26. $f(0.4) = 6.4$                  |
| 7. $g(-4) = 15$ | 17. $g(-10) = 99$ | 27. $g(\frac{1}{2}) = -\frac{3}{4}$ |
| 8. $h(5) = 19$  | 18. $h(3) = 13$   | 28. $h(-1.2) = -1$                  |
| 9. $k(-3) = 31$ | 19. $k(6) = 49$   | 29. $k(\frac{1}{2}) = 1$            |
| 10. $p(-9) = 9$ | 20. $p(99) = -99$ | 30. $p(\sqrt{6}) = -\sqrt{6}$       |



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$$5x^2 + 9x - 17$$

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$$2x^2 + 4x - 9 - 3x^2 - 5x + 8$$

$$-x^2 - x - 1$$

3. Find  $f(2) + g(2)$

$$f(2) = 12 + 10 - 8 = 14$$

$$g(2) = 8 + 8 - 9 = 7$$

$$14 + 7 = 21$$

4. Find  $2f(x) - g(x)$

$$2(3x^2 + 5x - 8) - (2x^2 + 4x - 9)$$

$$6x^2 + 10x - 16 - 2x^2 - 4x + 9$$

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Given the functions  $f(x) = 2x^2 + 3x - 5$  and  $g(x) = x^2 + 5x$  and  $h(x) = 3x^2$

5. Find  $h(x) \cdot g(x)$  DISTRIBUTE

$$3x^2(x^2 + 5x)$$

$$3x^4 + 15x^3$$

6. Find  $\frac{f(x)}{g(x)}$

$$\frac{2x^2 + 3x - 5}{x^2 + 5x}$$

← BIG x  
← GCF  
← CANNOT SIMPLIFY

$$\frac{5}{2/3} = \frac{5 \cdot 3}{2} = \frac{15}{2}$$

9. Find  $h(g(x))$

6. Find  $2g(x) \cdot f(x)$

$$2(x^2 + 5x) \cdot (2x^2 + 3x - 5)$$

$$(2x^2 + 10x)(2x^2 + 3x - 5)$$

$$4x^4 + 6x^3 - 10x^2 + 20x^3 + 30x^2 - 50x$$

$$4x^4 + 26x^3 + 20x^2 - 50x$$

8. Find  $\frac{g(x)}{h(x)}$

$$\frac{x^2 + 5x}{3x^2} \rightarrow \frac{x(x+5)}{3x^2} \rightarrow \frac{x+5}{3x}$$

10. Find  $f(-1)$

$$2(-1)^2 + 3(-1) - 5$$

$$2(1) + -3 - 5$$

$$2 - 3 - 5 = -6$$

11. Find  $g(-3)$

$$(-3)^2 + 5(-3)$$

$$9 - 15 = -6$$

12. Find  $h(g(f(1)))$

FIND  $f(1)$

$$2(1)^2 + 3(1) - 5$$

$$2 + 3 - 5 = 0$$

FIND  $h(g(0))$

FIND  $h(0)$

$$g(0) = 0^2 + 5(0) = 0 + 0 = 0$$

13. Find  $f(2) - g(3)$

$$2(2)^2 + 3(2) - 5$$

$$2(4) + 6 - 5$$

$$8 + 6 - 5 = 9$$

$$3^2 + 5(3)$$

$$9 + 15 = 24$$

$$9 - 24 = -15$$

14. Find  $h(g(-2))$

FIND  $g(-2)$  first

$$3(-2)^2$$

$$12$$

then find  $h(12)$

$$2(12)^2 + 3(12) - 5$$

$$2(144) + 36 - 5$$

$$288 + 36 - 5 = 319$$

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2. Find  $g(x) - f(x)$

3. Find  $f(2) + g(2)$

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Given the functions  $f(x) = 2x^2 + 3x - 5$  and  $g(x) = x^2 + 5x$  and  $h(x) = 3x^2$ 

5. Find  $h(x) \cdot g(x)$

6. Find  $2g(x) \cdot f(x)$

6. Find  $\frac{f(x)}{g(x)}$

8. Find  $\frac{g(x)}{h(x)}$

9. Find  $h(g(x))$

10. Find  $f(-1)$

11. Find  $g(-3)$

12. Find  $h(g(f(1)))$

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- |                |              |                       |
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