

# COMBINING AND COMPOSITION OF FUNCTIONS

- 1a) x-intercept:  $\frac{4}{3}$       b) x-intercept: 5  
 y-intercept: -4              y-intercept: -2  
 slope: 3                      slope:  $\frac{2}{5}$

- 2a) x-intercept(s): none      b) x-intercept(s):  $2 \pm \sqrt{\frac{5}{2}}$   
 y-intercept:  $\frac{17}{4}$               y-intercept: 3

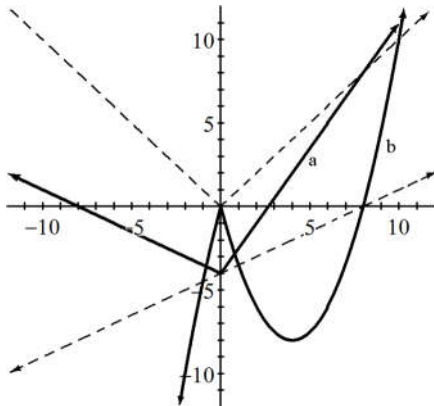
- Vertex: (3, 2)                  Vertex: (2, -5)  
 Domain:  $x \in \mathbb{R}$               Domain:  $x \in \mathbb{R}$   
 Range:  $y \geq 2$               Range:  $y \geq -5$

- 4 Domain:  $x \in \mathbb{R}, x \neq 0$ ; Range:  $y \in \mathbb{R}, y \neq 0$   
 Asymptotes:  $x = 0, y = 0$

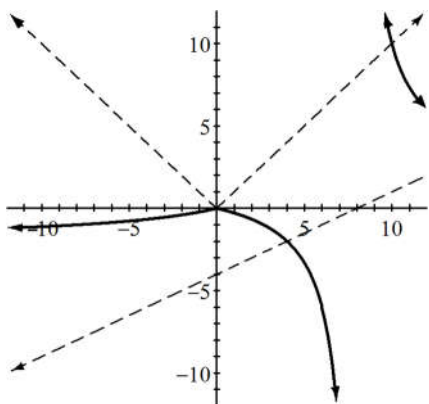
- 7 Domain:  $x \in \mathbb{R}$ ; Range:  $y > 0$   
 Asymptote:  $y = 0$

8 C

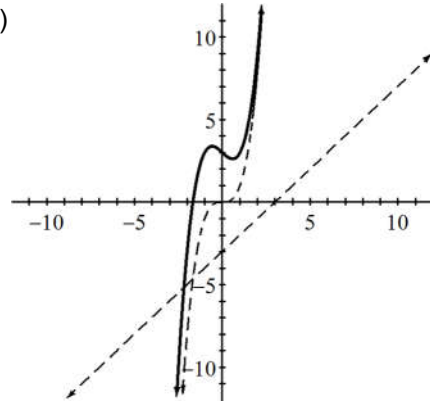
9a,b)



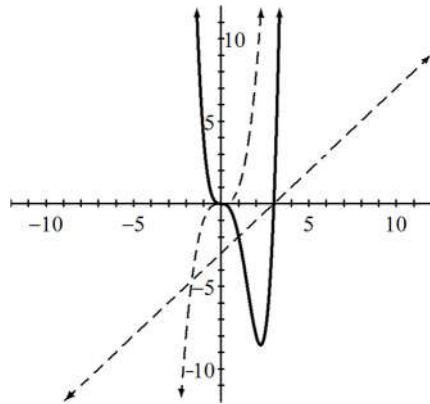
c)



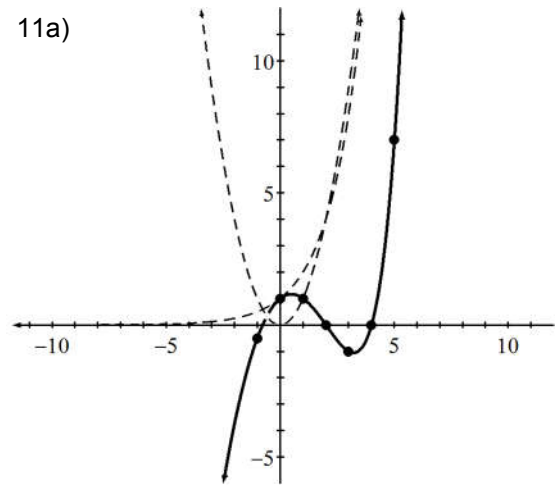
10a)



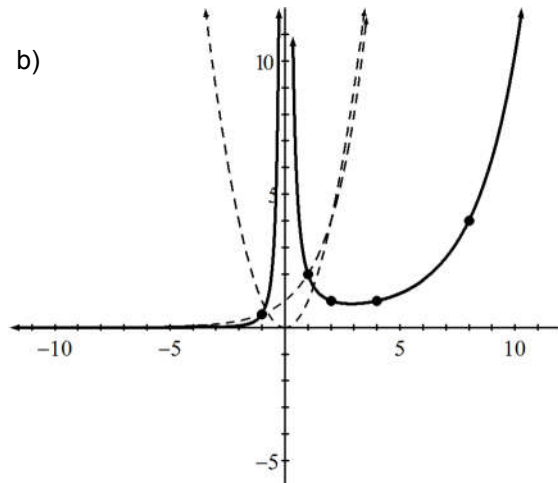
b)

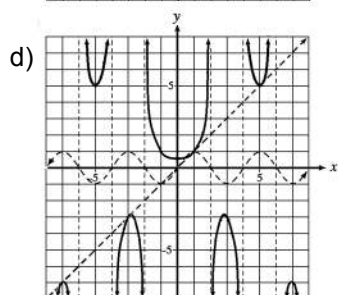
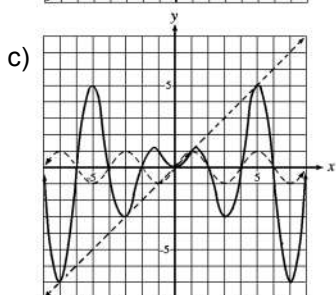
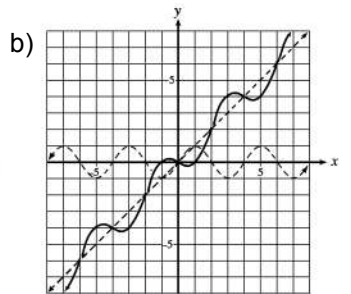
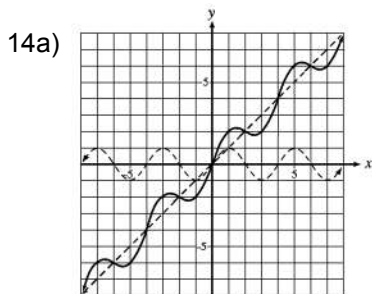
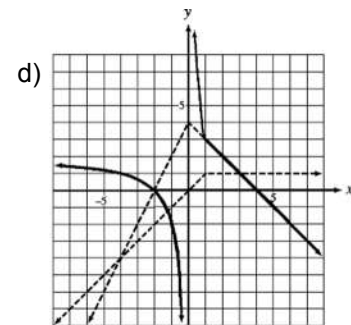
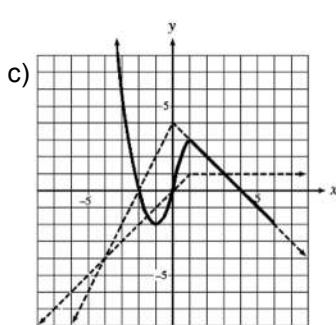
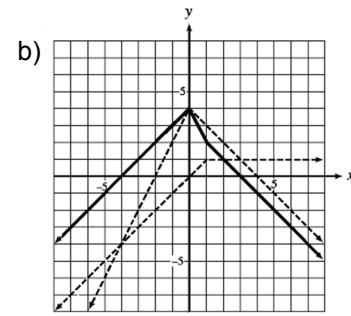
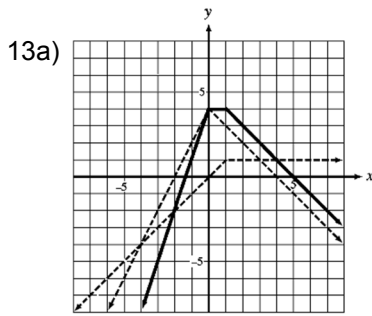
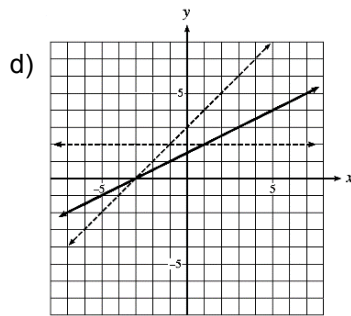
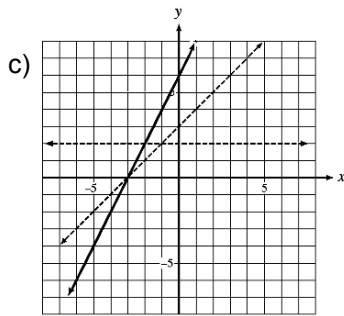
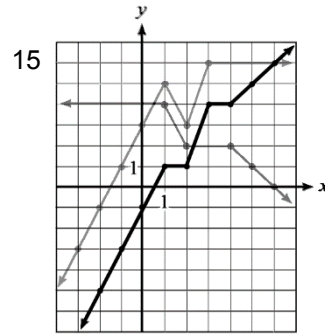
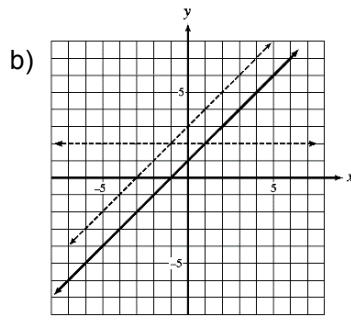
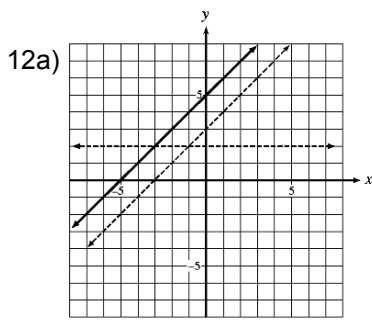


11a)

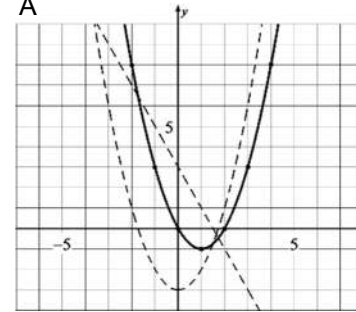


b)





- 16 A  
17 D  
18 B  
19 A  
20



$y = x^2 - 2x$ , Domain:  $x \in \mathbb{R}$ ;  
Range:  $y \geq -1$

- 21 A  
22 A  
23  $j(x) = 3x$ , Domain:  $x \neq 2$ ;  
Range:  $y \neq 6$   
24  $\frac{1}{5}$   
25  $x \neq 2$   
26  $x \in \mathbb{R}, x \neq \pm 1$   
27  $f(x) = 2x - 1$ ;  $g(x) = x + 3$   
Other answers possible  
28 a) 6    b) -8    c) -7  
d)  $-\frac{1}{7}$     e) 8

- 29 D  
30a)  $f(g(x)) = x^2 - 4$   
b)  $g(f(x)) = x^2 - 2x - 2$   
c)  $f(f(x)) = x^4 - 4x^3 - 4x^2 + 16x + 12$   
d)  $g(g(x)) = x + 2$   
31  $h(x) = \sqrt{3x - 2}$ , Domain:  $x \geq \frac{2}{3}$   
32  $f(g(x)) = x^2 - 1$   
33 2  
34 3  
35  $f(g(x)) = x$ ; Domain:  $x \geq -1$   
36a)  $x^2 - 4$   
b)  $x^2 - 2x - 2$   
37a) -2    b) 3    c)  $k = 2$  or -3  
38 C  
39 28  
40 13  
41  $h(f(g(x))) = 2\sqrt{x^2 + 2} - 5$ ;  
Domain:  $x \in \mathbb{R}$

42a)  $h(x) = -3x + 6$ ; Domain:  $x \in \mathbb{R}$

Range:  $y \in \mathbb{R}$

b)  $h(x) = -2x^2 + 13x + 7$ ;

Domain:  $x \in \mathbb{R}$ ; Range:  $y \leq 28.125$

c)  $h(x) = \frac{2x+1}{7-x}$ , Domain:  $x \neq 7$ ;

Range:  $y \in \mathbb{R}$

d)  $h(x) = -2x + 15$ , Domain:  $x \in \mathbb{R}$ ;

Range:  $y \in \mathbb{R}$

43 D

44 78

45 C

46 A

47 B

48 a) 5 b) not possible