

Chapter One Practice

1. $|2x-1| < 7$

$2x-1 < 7$ and $2x-1 > -7$

$2x < 8$

$2x > -6$

$x < 4$

$x > -3$



$(-3, 4)$

2. $|x-3| \geq 4$

$x-3 \geq 4$ or $x-3 \leq -4$

$x \geq 7$

$x \leq -1$



$(-\infty, -1] \cup [7, \infty)$

3. $3|2x-5| + 1 = 28$

$3|2x-5| = 27$

$|2x-5| = 9$

$2x-5 = 9$ or $2x-5 = -9$

$2x = 14$

$2x = -4$

$x = 7$

$x = -2$

4. $|x+2| < -1$

$x+2 < -1$ and $x+2 > 1$

$x < -3$

$x > -1$



no solution

5. $x^2 - 7x + 12 < 0$

$(x-3)(x-4) < 0$

$x=3$

$x=4$



$(3, 4)$

6. $x^2 - 6x > 7$

$x^2 - 6x - 7 > 0$

$(x-7)(x+1) > 0$

$x=7$

$x=-1$



$(-\infty, -1) \cup (7, \infty)$

7. $(f \circ g)(x)$

$(x+2)^2 - 4$

$x^2 + 2x + 4 - 4$

$x^2 + 2x$

8. $(g \circ f)(x)$

$(x^2 - 4) + 2$

$x^2 - 2$

9. $(f \circ g)(3)$

21

10. $y = x^2 + 10x + 29$

$y - 29 + 25 = x^2 + 10x + 25$

$y - 4 = (x+5)^2$

$y = (x+5)^2 + 4$

see graph

11. see graph

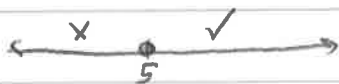
12. see graph

13. see graph

15. see graph

16. $f(x) = \sqrt{x-5}$

$$x \geq 5$$



$$D: [5, \infty)$$

$$R: [0, \infty)$$

17. $f(x) = |x+9| - 3$

$$D: (-\infty, \infty)$$

$$R: [-3, \infty)$$

18. $f(x) = x^2 - 6x + 2$

$$f(x) - 2 + 9 = x^2 - 6x + 9$$

$$f(x) + 7 = (x-3)^2$$

$$f(x) = (x-3)^2 - 7$$

$$D: (-\infty, \infty)$$

$$R: [-7, \infty)$$

19. $2\log_4(x-3) + \log_4(2x)$

$$\log_4(x-3)^2 + \log_4(2x)$$

$$\log_4 2x(x-3)^2$$

20. $7^{x+4} = 96$

$$\log_7 96 = x+4$$

$$x = \log_7 96 - 4$$

21. $\log_3 17 = x$

$$x = 2.579 \text{ (calc)}$$

22. $e^{3x} = 28$

$$\ln 28 = 3x$$

$$x = \frac{\ln 28}{3}$$

23. $\sin 4\pi/3 = -\sqrt{3}/2$

24. $\sec^{-\pi/6} = 2\sqrt{3}/3$

25. $\tan \pi = 0$

26. $\frac{\cos^2 \theta}{1 + \sin \theta} = 1 - \sin \theta$

$$\frac{1 - \sin^2 \theta}{1 + \sin \theta} = 1 - \sin \theta$$

$$\frac{(1 + \cancel{\sin \theta})(1 - \cancel{\sin \theta})}{1 + \cancel{\sin \theta}} = 1 - \sin \theta$$

27. a) $f(5) = 9$

b) $f(1) = -2$

c) $(f \circ f)(-3) = 11$

see sketch

28. a) $f(-7) = 2$

b) $f(2) = 3$

c) $f(6) = 3$

d) $(f \circ f)(2) = 3/2$

e) $(f \circ f)(-6) = 1 + \sqrt{3}$

see sketch

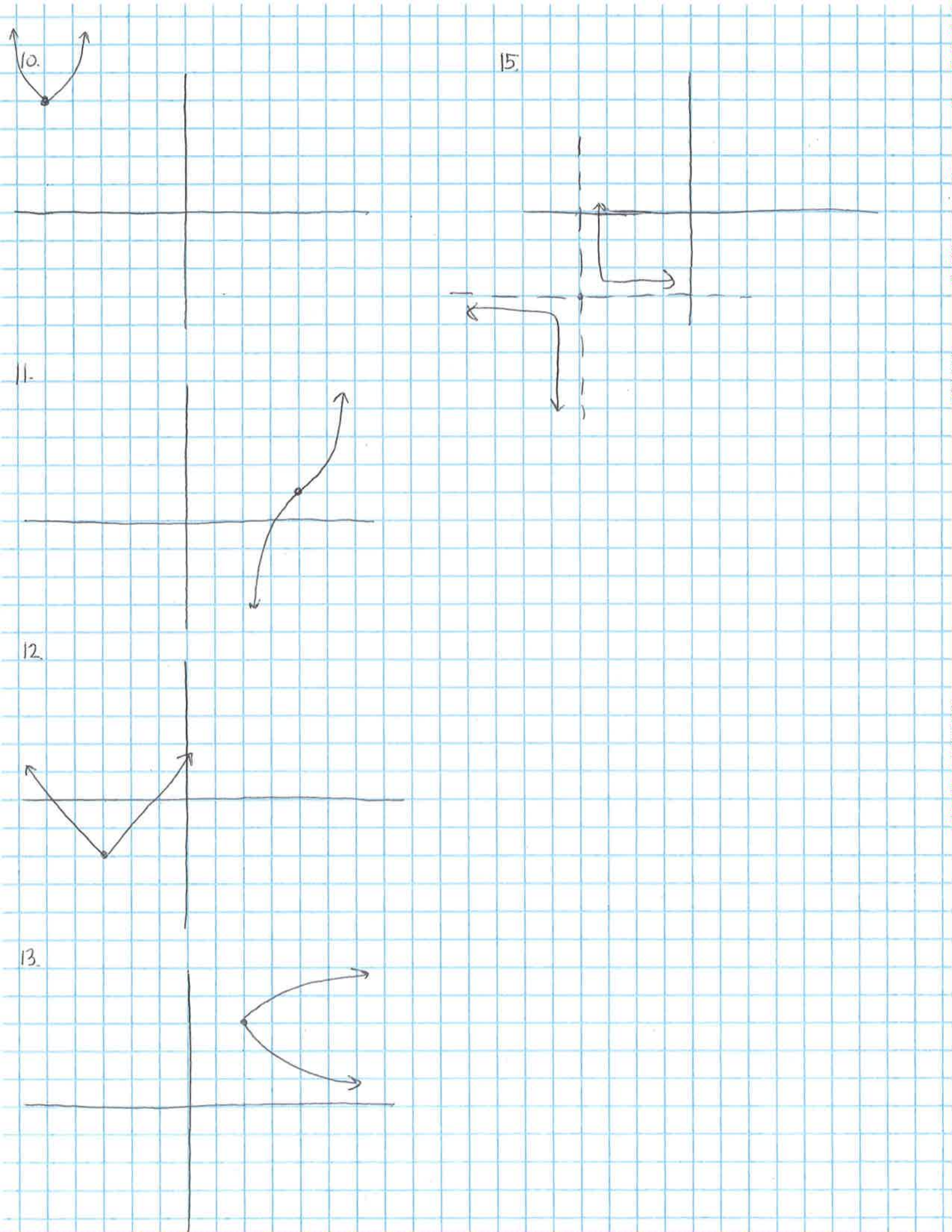
29. $f(x) = x^3 + 2x - 4$

$$g(x) = 5x^2 - 7$$

a) $x = 1.1795$

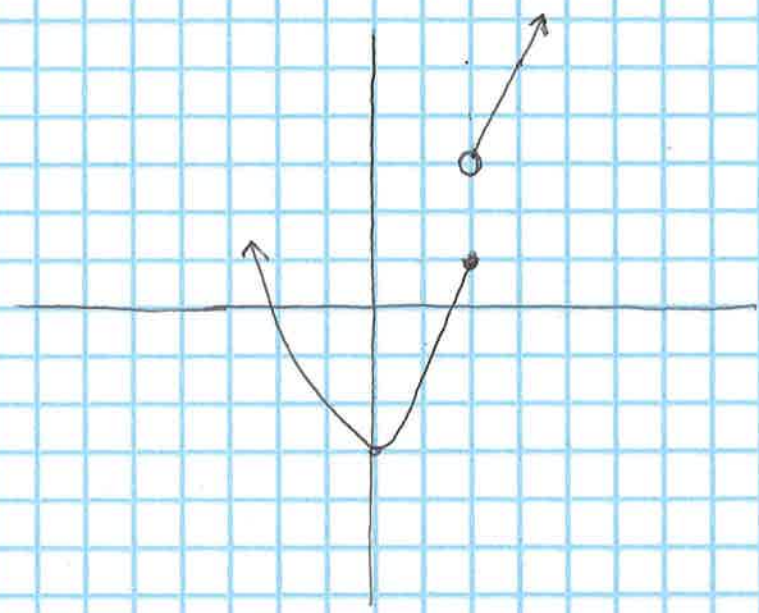
b) $x = -5.76$ ($y = -5.342$)

$x = 1.187$ ($y = .048$)



27.

$$f(x) = \begin{cases} x^2 - 3 & x \leq 2 \\ 2x - 1 & x > 2 \end{cases}$$



28.

$$f(x) = \begin{cases} |x+3| - 2 & x \leq -2 \\ 1 + \sqrt{x+2} & -2 < x \leq 2 \\ \frac{1}{2}x & x > 2 \end{cases}$$

