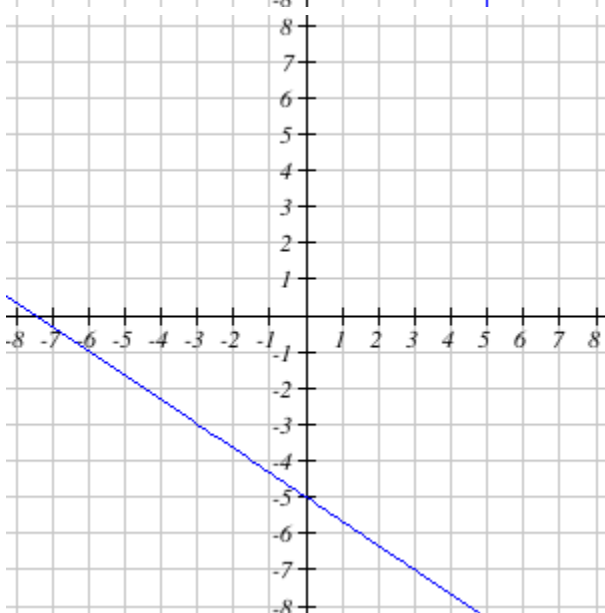
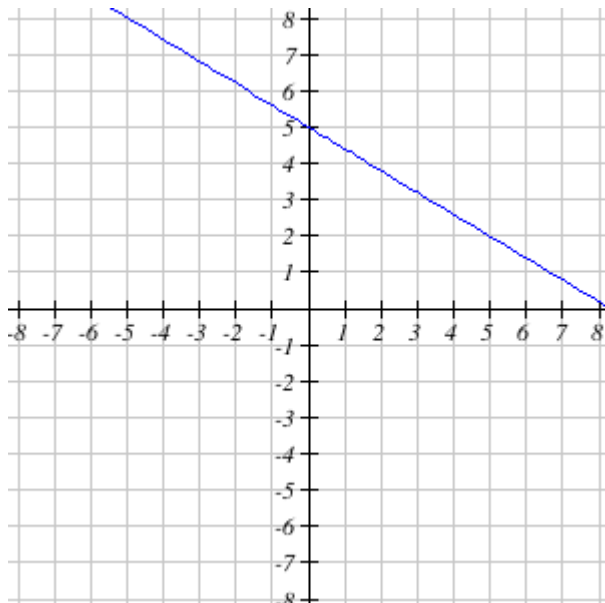
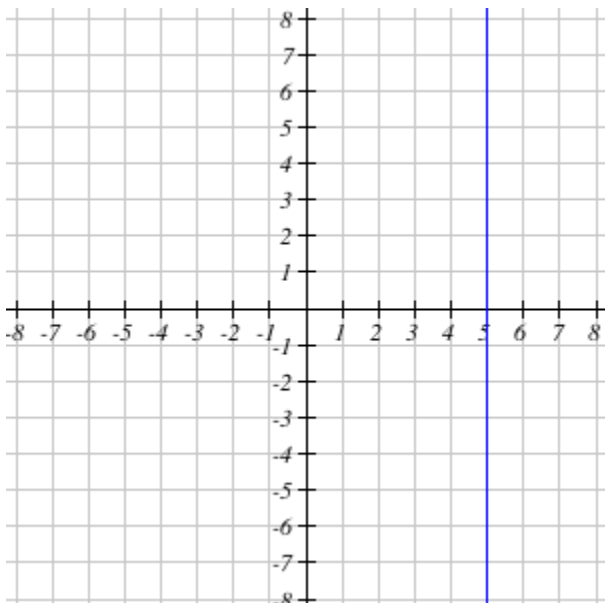
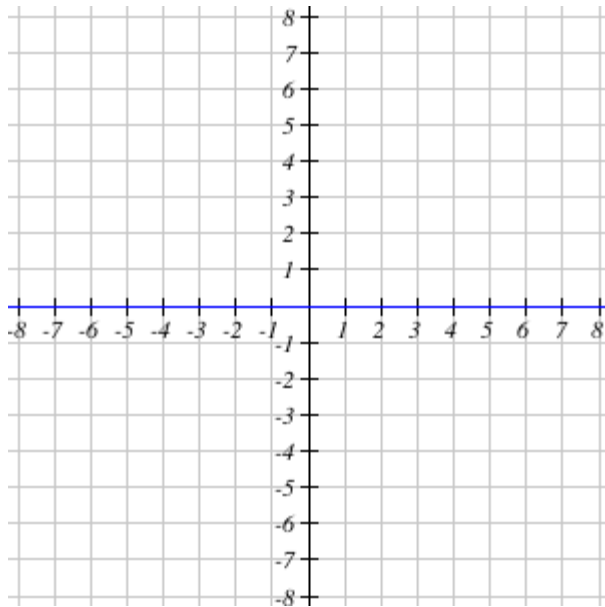
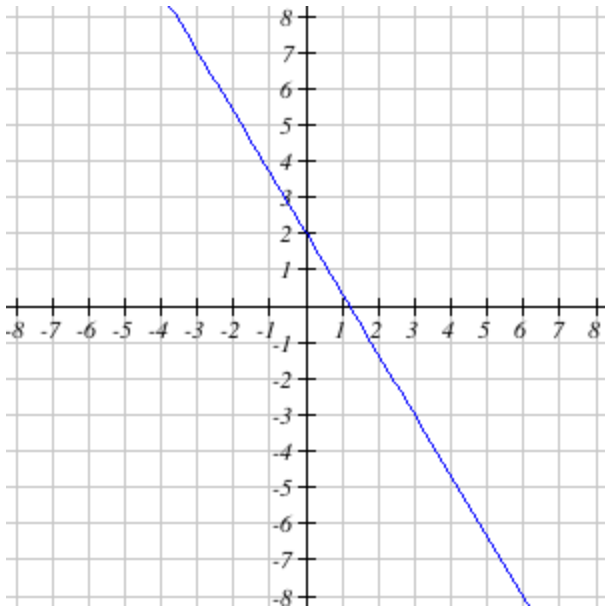


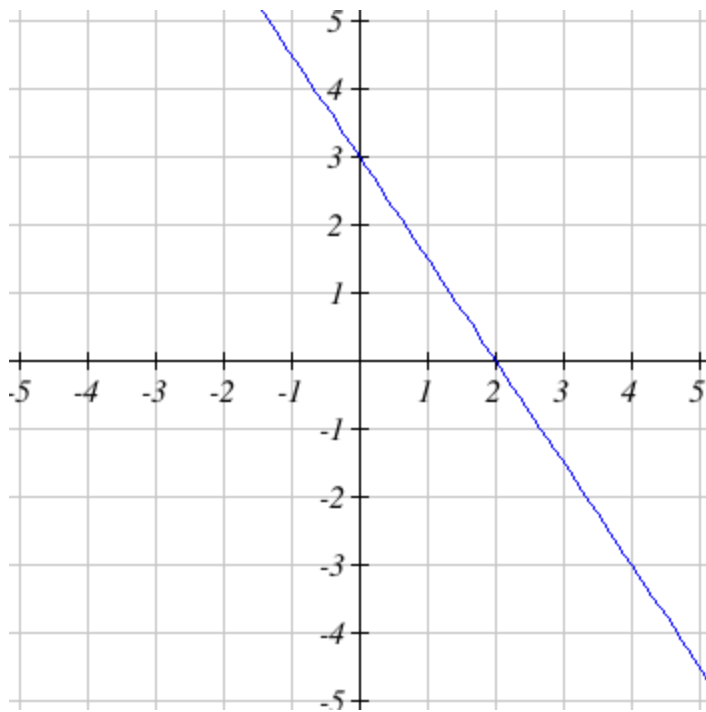
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## Lecture 10 Answers

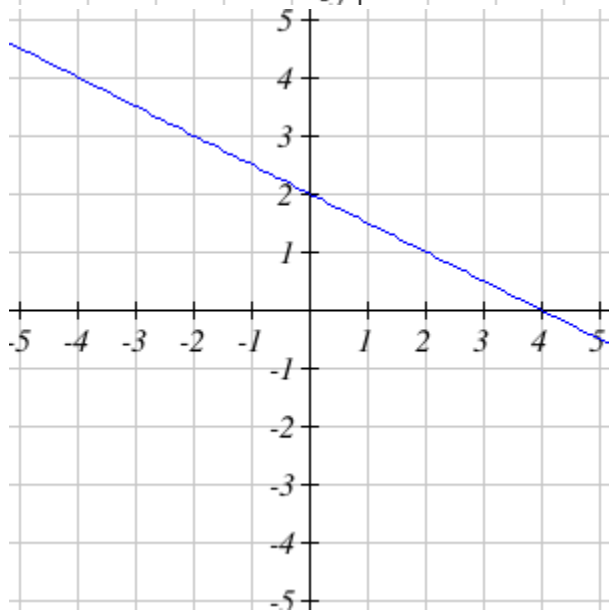
1.  $\frac{6}{5}$
2.  $\frac{3}{7}$
3. 0
4. DNE
5. There are many possible answers.
6. Yes
7.  $\frac{4}{3}$
8.  $-\frac{7}{3}, -\frac{7}{6}, -\frac{14}{15}$
9. 0
10. *DNE*
11. 40
12.
  - $\frac{11}{2}$  pounds per month
  - 5.5 pounds per month
  - 55 pounds every 10 months
  - one pound per  $\frac{2}{11}$  months
  - 66 pounds per year
13. 3 , The cost per square yard of carpet
14. Yes, the ratio of change in input to change in output is constant
15. No, the ratio of change in input to change in output is not constant
16. There are many possible answers.

17.

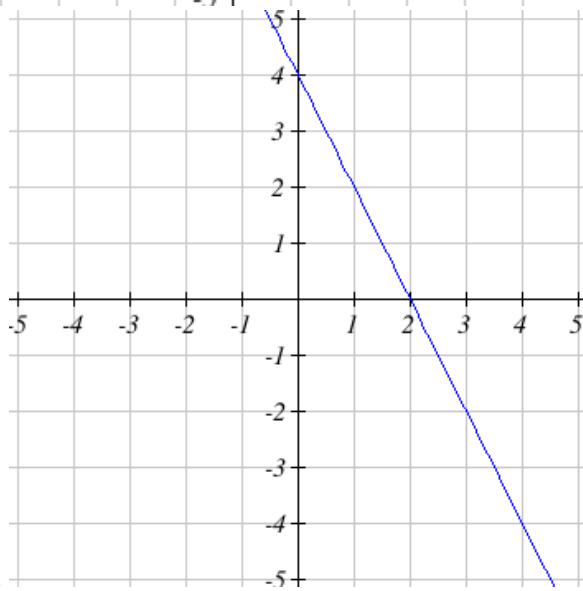




18.



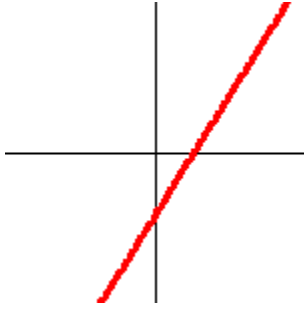
19.



20. 2, 4,

21.  $(-\frac{3}{2}, 0), (0, -3)$

22.  $-15, -6$



23.

24.  $y = -6$

25.  $x = 8$

26. There are many possible answers

27.  $-\frac{1}{6}x + \frac{19}{6}$

28.  $\frac{1}{3}(x + 5) - 8$  or  $\frac{1}{3}(x + 8) - 9$

29.  $y + 3 = 5(x - 7)$  or  $y = 5(x - 7) - 3, y = 5x - 38$

30.  $-\frac{8}{7}, 0$

31.  $y = -\frac{1}{4}x, y = -\frac{5}{4}x + 3, y = 1, y = 5x - 2, x = 5$

32.  $4x - 3$

33. There are many possible answers

34. they intersect at a right angle

35.  $\frac{1}{5}x + 4$

36.  $-\frac{5}{4}, 1$

37. There are many possible answers

38.  $70x + 20, 5$

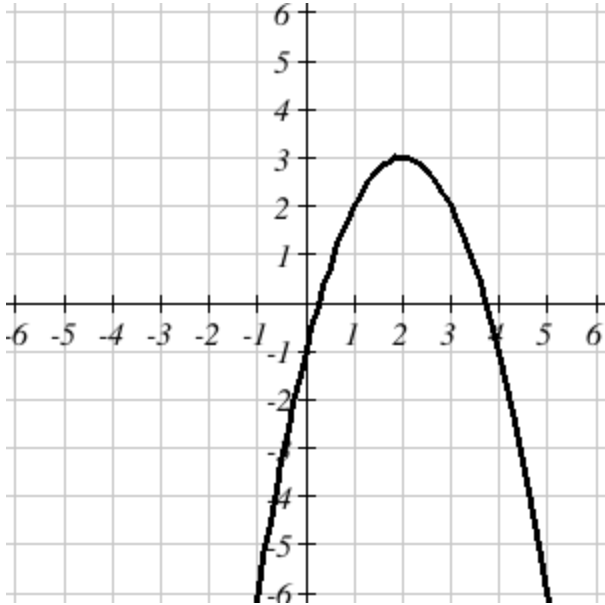
39.  $80t + 3960, 4920$

40.  $V(t) = 131500 - 4500t, \$122500$

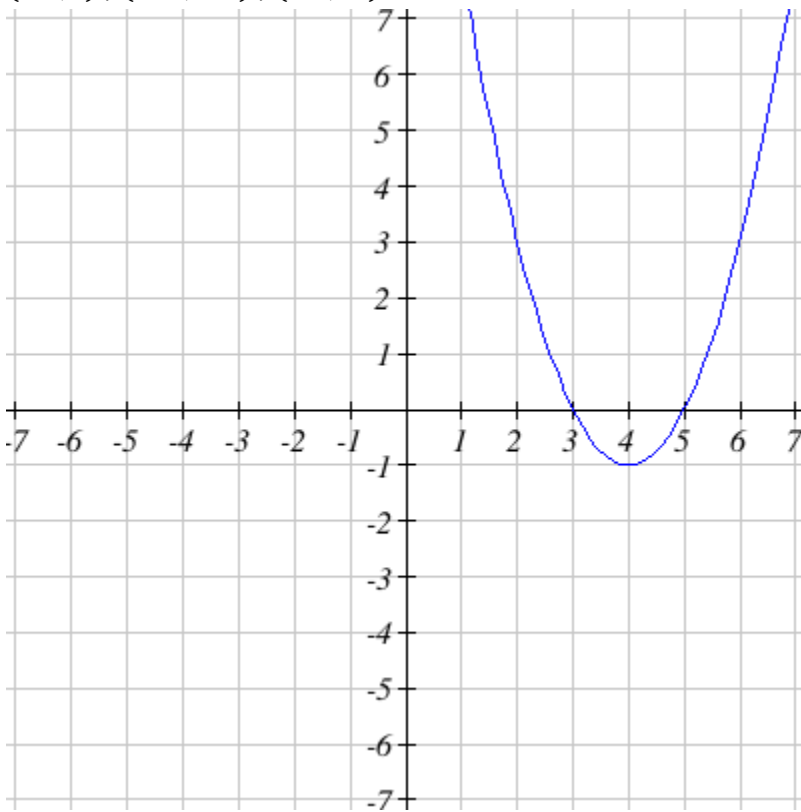
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### Lecture 11 Answers

1. all of the above

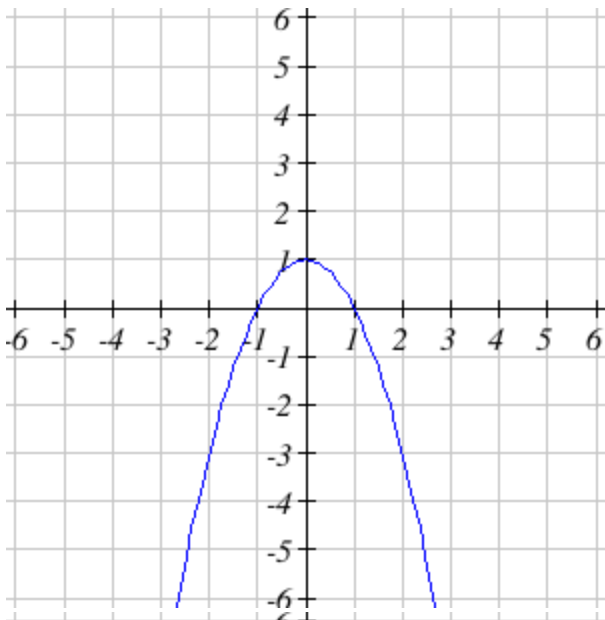


2.  
3. narrower , opposite  
4.  $y = -x^2 + 11x + 7$   
5. minimum , -3 , -4 ,  $(-4, \infty)$  ,  $(-\infty, -4)$   
6.  $(-4, 2)$  ,  $(-\infty, -4)$  ,  $(-4, \infty)$

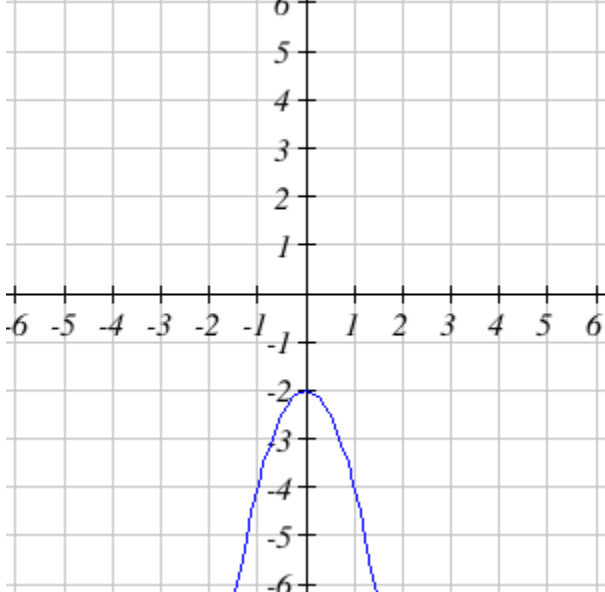


7.  
8.  $(4, -5)$  ,  $x = 4$  , downwards  
9. There are many possible answers.

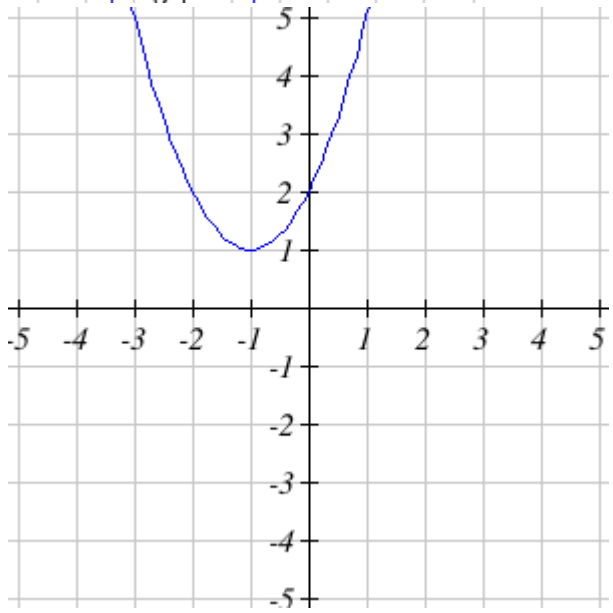
10.

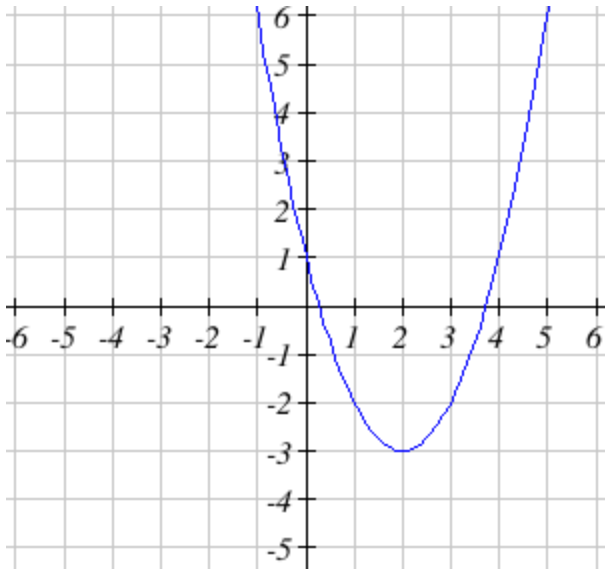


11.

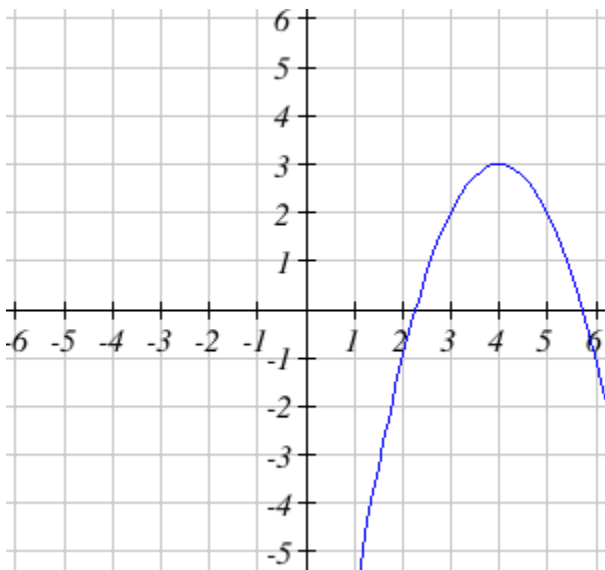


12. -1, 1, 2,



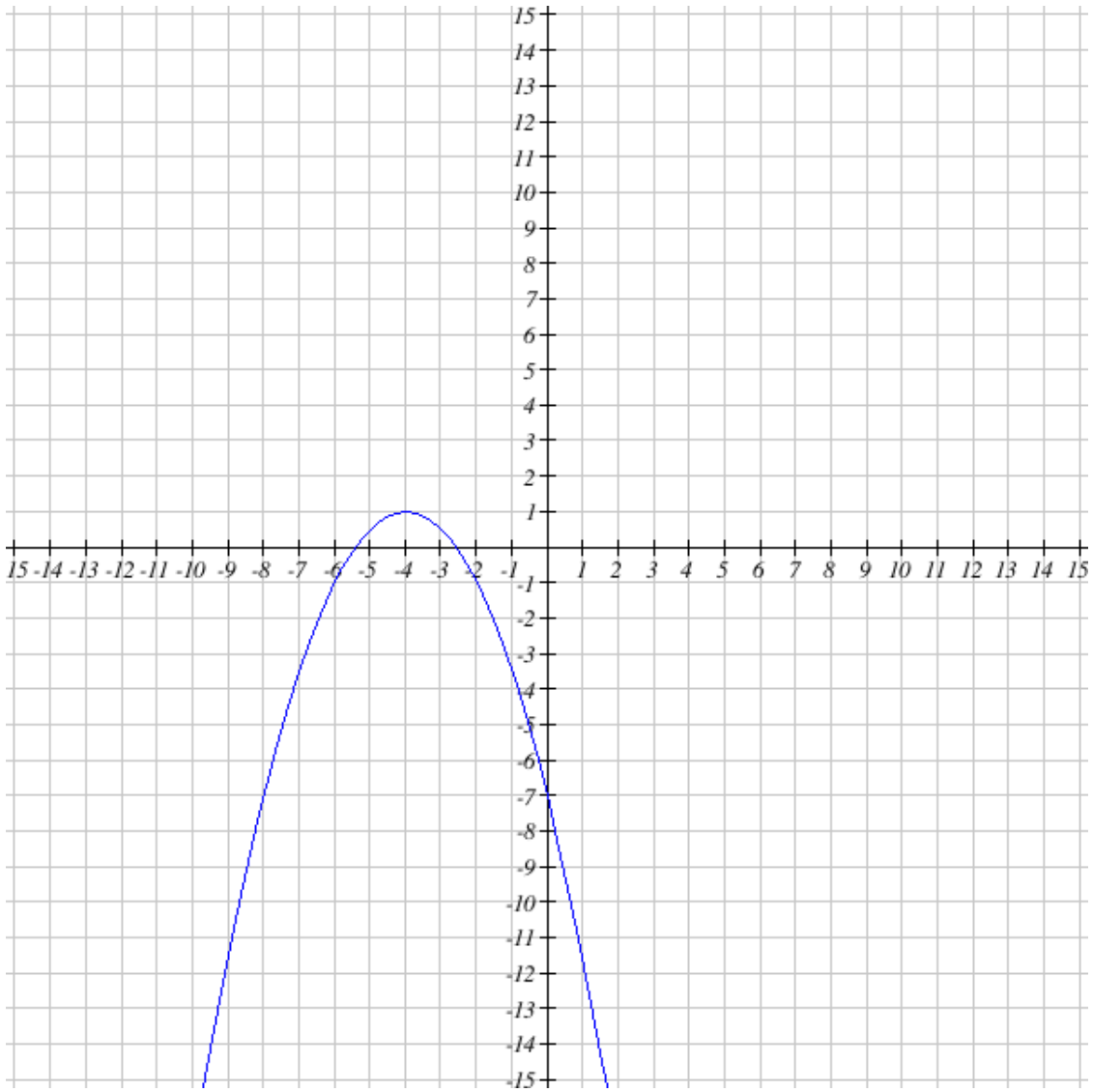


13. , All real numbers ,  $y \geq -3$

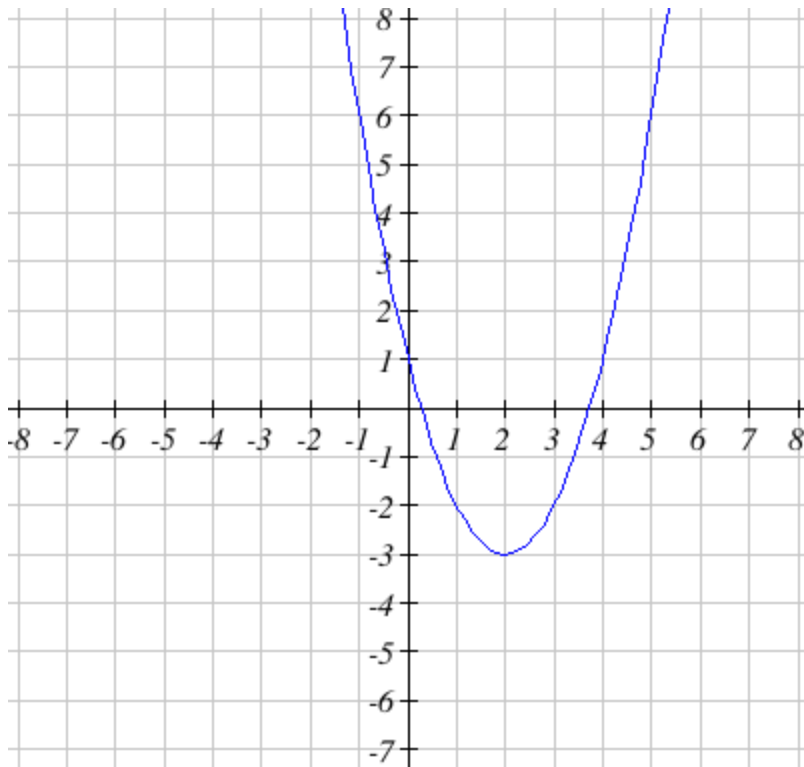


14. , All real numbers ,  $y \leq 3$

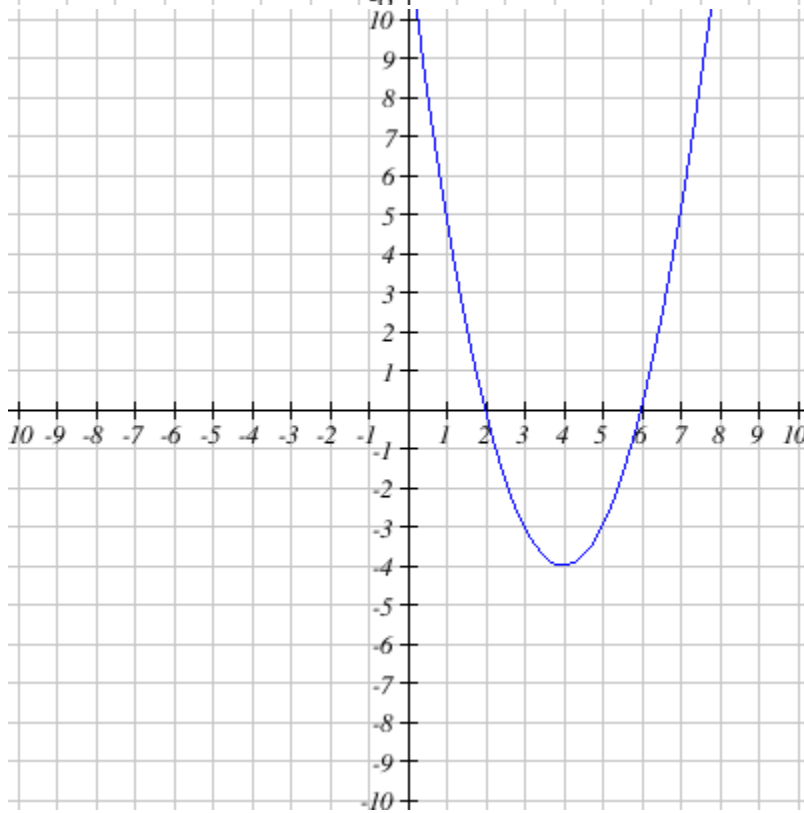
15.







16.



17.

, (4, -4), (0, 12), (2, 0), (6, 0), (-∞, ∞),

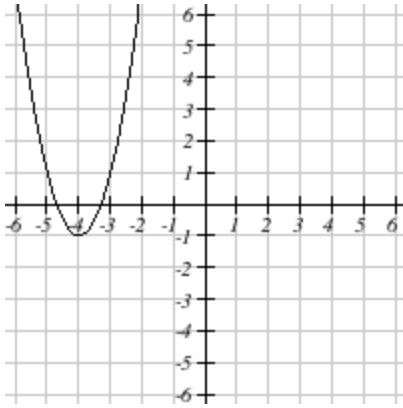
$[-4, \infty)$ ,  $x=4$

18. -1, 5, 5, 2, 9,  $x = 2$

19. (3, 12), (0, -24),  $(3 + \sqrt{3}, 0)$ ,  $(3 - \sqrt{3}, 0)$ , (1.27, 0), (4.73, 0)

20.  $(3 + \sqrt{\frac{8}{3}}, 0)$ ,  $(3 - \sqrt{\frac{8}{3}}, 0)$

21. 60, -159

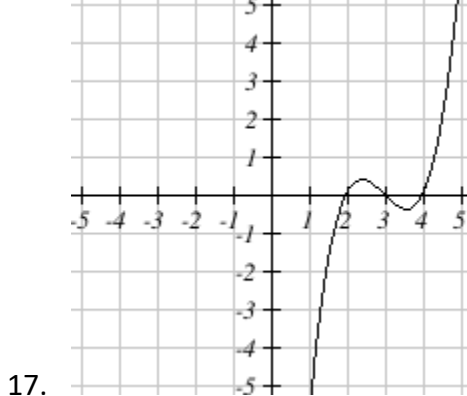
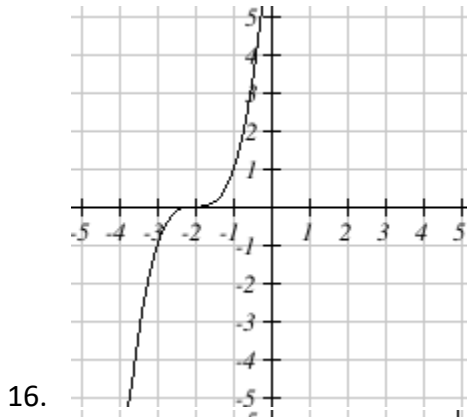


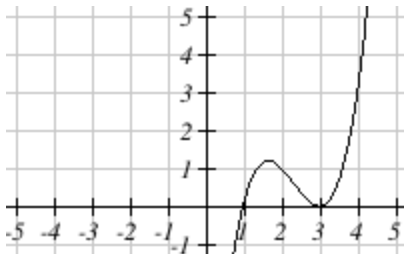
- 22.
23.  $2 \cdot (x + 1)^2 + 0$
24.  $3(x - 1)^2 + 4$
25.  $(x - 5)^2 - 9, (5, -9)$
26.  $(x + 2)^2 + 1, (x - 8)^2 - 8$
27.  $x^2 - 17$
28.  $x^2 + 6x - 54$
29. , 90
30. The  $h$  intercept , The  $h$  coordinate of the vertex , The  $t$  intercept
31. 1156 , 2.5 , 11
32. 225 , 7
33. 190 , 190 , 36100
34.  $w \cdot (450 - 2 \cdot w) , 112.5 , 25312.5$

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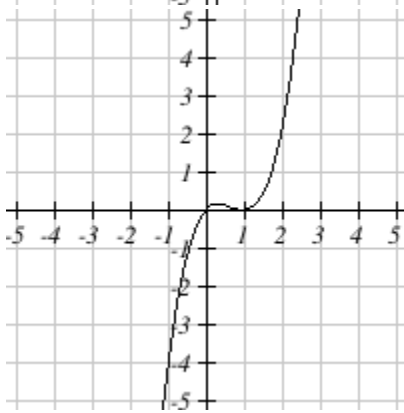
### Lecture 12 Answers

1. No, a polynomial is a function so it can only have one output for each input.
2.  $\frac{1}{27}$
3. -5
4.  $10x^5 + 3x^4 + 9x^3 - 10x^2 + 6$
5.  $\frac{1}{49}x^2 + \frac{1}{7}x + \frac{1}{4}$
6.  $\infty, \infty$
7.  $-\infty, \infty$
8.  $\infty, -\infty$
9.  $\infty, \infty$
10. 8, 6, 8
11. 12, 11
12. 3
13. 2
14. (0,90), (6,0), (-5,0), (3,0)
15. (0,0), (0,0), (-5,0), (7,0)





18.



19.

20.  $x^2 \cdot (x - 3)^2 \cdot (x + 3)$

21.  $0.2 \cdot x \cdot (x - 4)^2 \cdot (x + 4)$

22.  $-0.1 \cdot (x - 5)^2 \cdot (x + 4)$

23.  $\frac{1}{18} \cdot (x + 3)(x + 1)(x - 3)(x - 2)$

24.  $-\frac{1}{8} \cdot (x + 4)(x + 4)(x - 1)(x - 1)(x - 1)$

25.  $x - 7, 2 \cdot x + 5$

26.  $x + 3, 6$

27.  $x^2 - 2x - 1$

28.  $x^2 + 7x - 5 + \frac{7}{x-4}$

29.  $x^2 + 6 \cdot x + 5, 4$

30.  $x^2 - 2x + 4, 2$

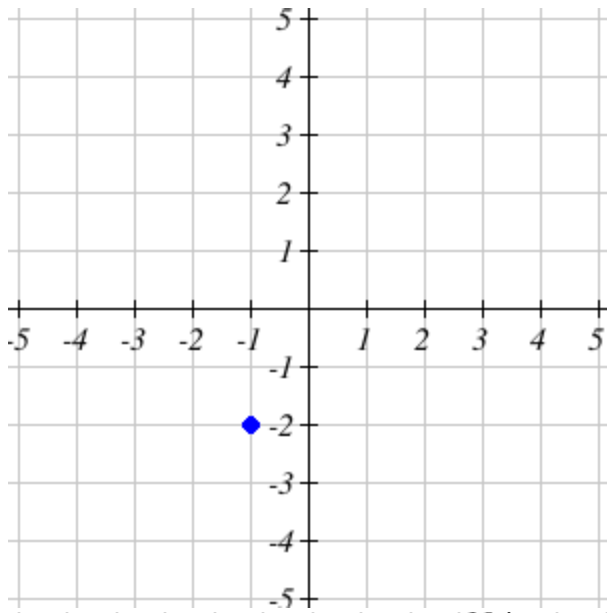
31.  $x^3 + x^2 + 6x + 5, 5$

32.  $x^4 + 5 \cdot x^2 + 7, -3$

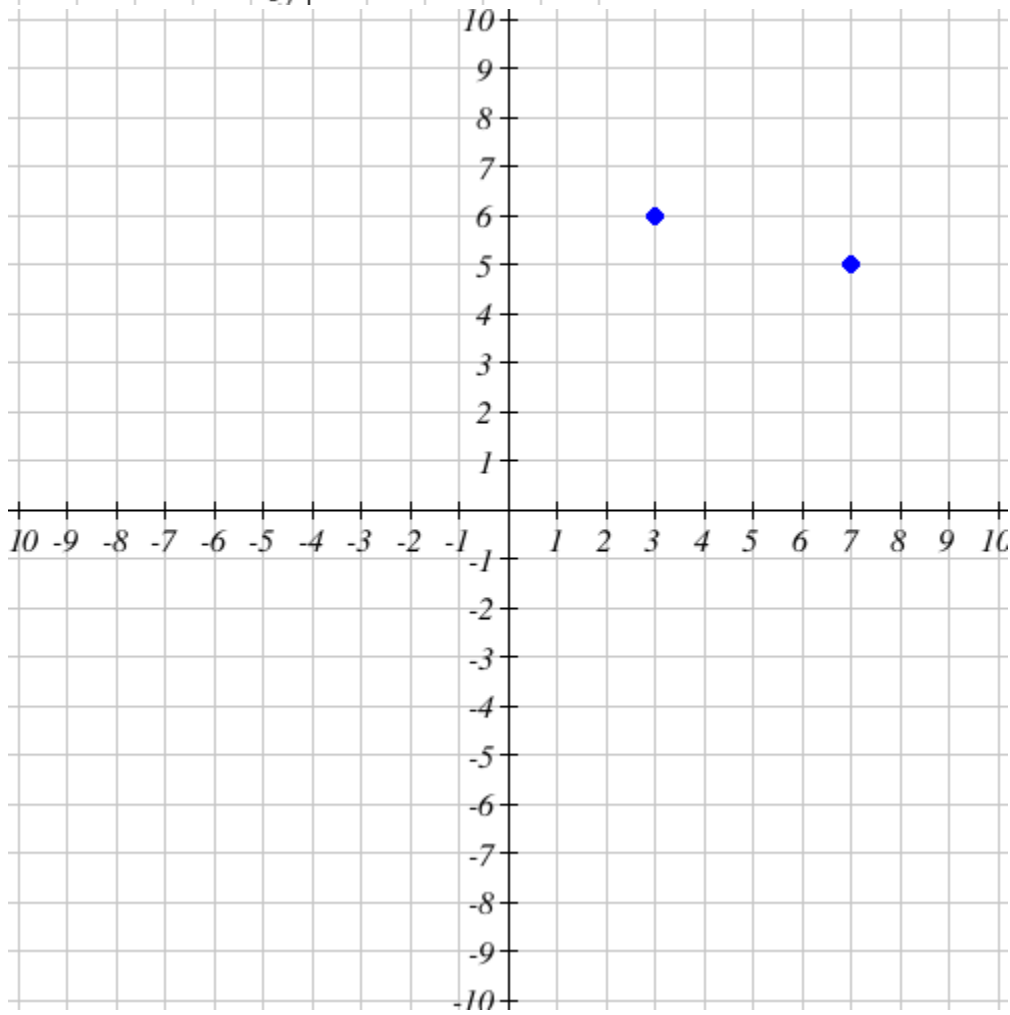
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### Lecture 13 Answers

1.  $i$
2.  $-1, -20$
3.  $10i$
4.  $7 - 9i$
5.  $i\sqrt{26}$
6.  $3\sqrt{2} \cdot i$
7.  $4i\sqrt{5}$
8.  $19 - 8i, 9 - 42i$
9.  $-35$
10.  $36$
11.  $32 + 74i$
12.  $13 + 107i$
13.  $11 + 60i$
14.  $-14 + 8i$
15.  $-80 + 48i$
16.  $10 - 4i$
17.  $-30 + 18i, 18, 116, \text{real}$
18.  $\frac{1}{4} - \frac{3}{4}i$
19.  $-5 - 12i$
20.  $\frac{-10-4i}{29}$
21.  $i, 1, 1, -1, -1, -i, 1, i$
22.  $-3 - 4i$
23.  $\sqrt{3}, -\sqrt{3}$
24.  $5i, -5i$
25.  $i\sqrt{11}, -i\sqrt{11}$
26.  $-3 - 1i, -3 + 1i$
27.  $4 + 3\sqrt{6}i, 4 - 3\sqrt{6}i$



28.



29.

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### Lecture 14 Answers

1. No, it is not a factor.
2.  $\frac{1}{3}, -\frac{5}{3}, 2$
3.  $-2, 2 + \sqrt{2}, 2 - \sqrt{2}$
4.  $5, -2 + \sqrt{2}, -2 - \sqrt{2}$
5.  $5, i, -i$
6.  $-1, -1 + \frac{\sqrt{3}}{3}i, -1 - \frac{\sqrt{3}}{3}i$
7.  $P(x) = (x + 1)(x + 2i)(x - 2i)$
8.  $P(x) = (x - 3)(x + 1)(3x - 1)(x - 2i)(x + 2i)$
9. -12
10.  $1, 2, 3, 4, 6, 8, 12, 24, \frac{1}{2}, \frac{3}{2}, \frac{1}{3}, \frac{2}{3}, \frac{4}{3}, \frac{8}{3}, \frac{1}{6}, 6, -\frac{1}{3}, -2$
11.  $1, 2, 3, 6, 9, 18, 27, 54, \frac{1}{2}, \frac{3}{2}, \frac{9}{2}, \frac{27}{2}, -\frac{1}{2}, 3\sqrt{2}, -3\sqrt{2}, 3$
12.  $1, 2, 3, 4, 6, 8, 12, 24, \frac{1}{2}, \frac{3}{2}, \frac{1}{3}, \frac{2}{3}, \frac{4}{3}, \frac{8}{3}, \frac{1}{6}, 6, -\frac{1}{3}, -2$
13.  $1, 2, 3, 6, 9, 18, 27, 54, \frac{1}{2}, \frac{3}{2}, \frac{9}{2}, \frac{27}{2}, -\frac{1}{2}, 3\sqrt{2}, -3\sqrt{2}, 3$

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### Lecture 15 Answers

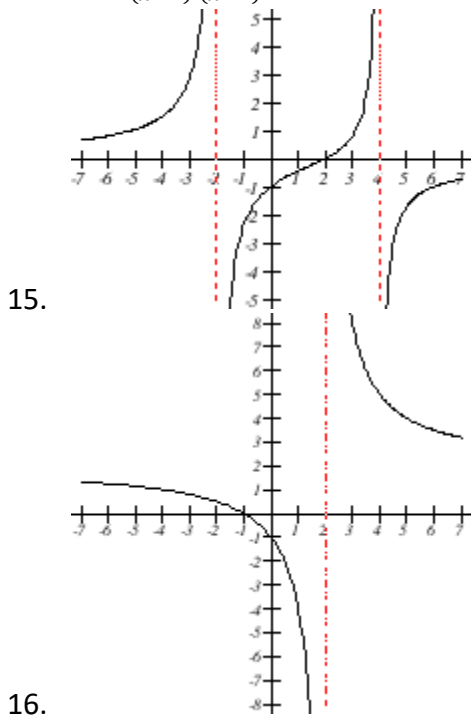
1.  $\frac{2}{9z^2}$
2.  $\frac{z-6}{2}$
3.  $\frac{9}{m+4}$
4.  $x - 12, 5$
5.  $\frac{2}{n+6}, -7$
6.  $\frac{x+6}{x-3}, -3$
7.  $1, -11$
8.  $-1, 15$
9.  $\frac{5x^5}{y^3}$
10.  $\frac{x-4}{x+2}, -5, 3, -3$
11.  $\frac{x+2}{x+4}, -1, 5, 1, -2$
12.  $(x + 10)(x - 12)$
13.  $(x - 2)(x - 10)(x + 5)$
14.  $(x + 10)^9(x + 8)^7$
15.  $\frac{-2x+2}{(x+1)(x-3)}$
16.  $\frac{8k-59}{(k-8)^2}$
17.  $\frac{x^2+5x}{(x+3)(x-3)}$
18.  $\frac{x+5}{x+6}, -3$
19. Multiply both sides by  $x + 7$
20. 18
21. -1
22. 7
23.  $-\frac{12}{7}$
24. 5
25.  $\frac{42}{19}$
26. -9
27. *DNE*
28. -17
29. 5
30. 48
31. 15



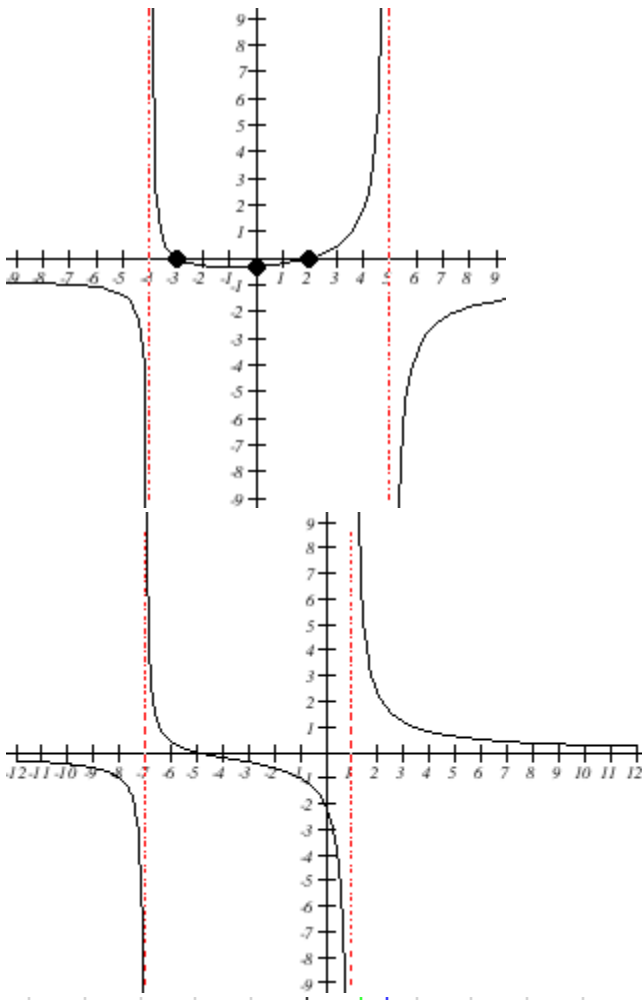
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**Lecture 16 Answers**

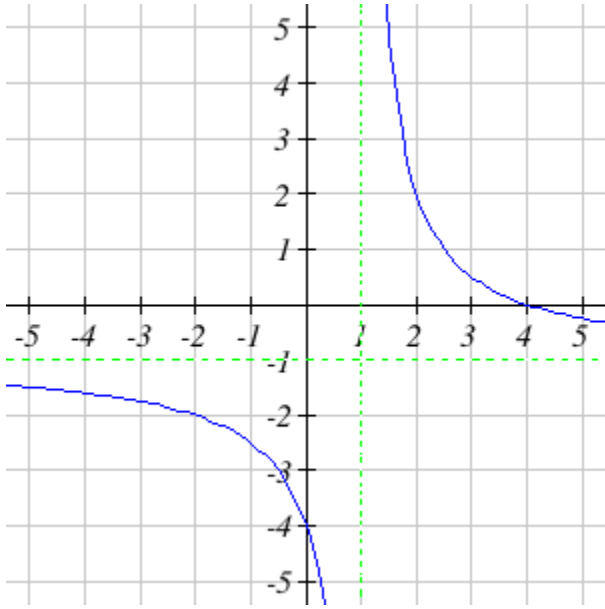
1. 19, 48, -75
2. 10, 6
3. -1, 6
4.  $(0, -9), (3, 0), (\frac{3}{2}, 0), 1, -\frac{1}{2}$
5. a Horizontal asymptote at  $y=0$ , a Horizontal asymptote at  $y=1$ , No horizontal asymptote
6.  $-\frac{1}{3}$
7.  $(0, \frac{2}{3}), (4, 0), (\frac{1}{2}, 0), -3, -\frac{2}{3}, \frac{2}{3}$
8.  $-12 \cdot \frac{(x-2)(x+1)}{(x+2)(x+3)}$
9.  $7 \cdot \frac{(x-6)(x-2)}{(x+4)(x+1)}$
10.  $\frac{-8(x-3)}{3(x+1)(x-4)}$
11.  $-24 \cdot \frac{x-2}{(x+3)(x-4)^2}$
12.  $5.4 \cdot \frac{(x-1)^2}{(x+2)(x-3)^2}$
13.  $-2 \cdot x \cdot \frac{x-2}{(x+2)(x-4)}$
14.  $32 \cdot \frac{x-2}{(x+2)(x-4)^2}$



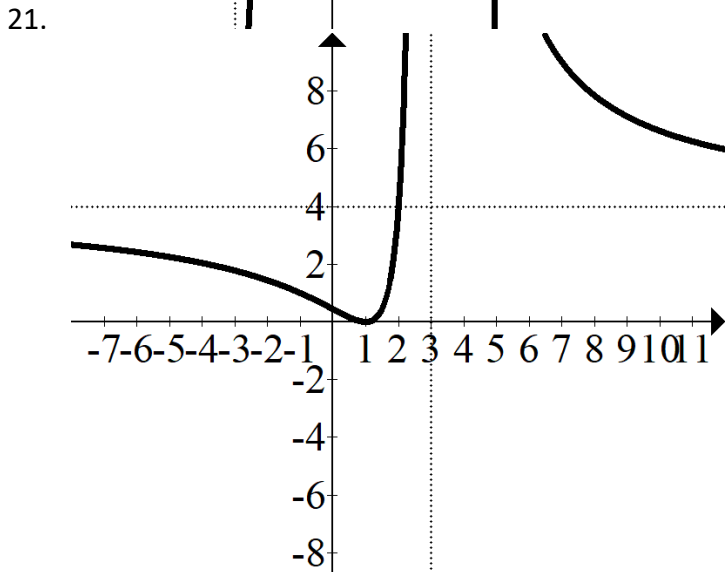
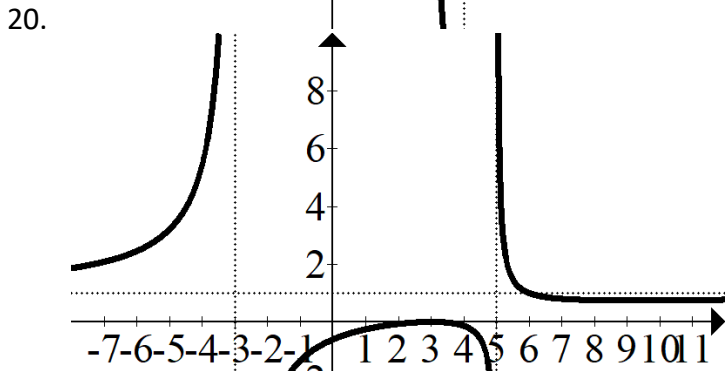
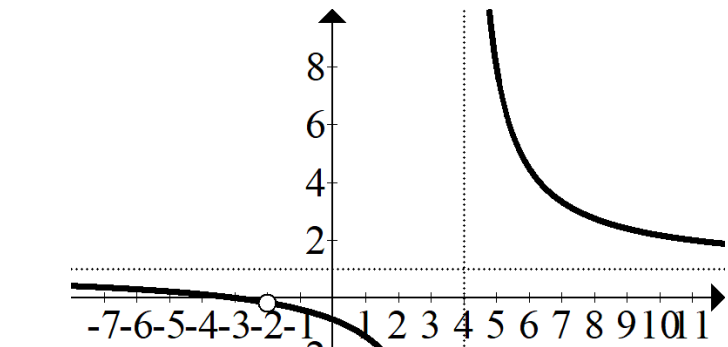
17.

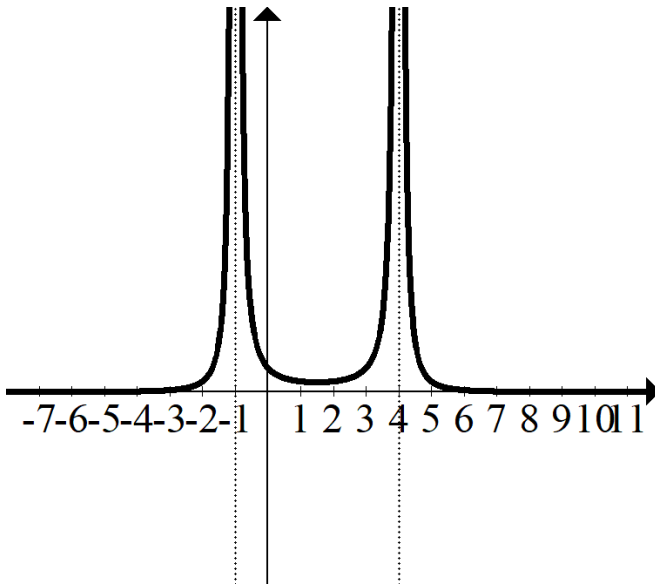


18.



19.





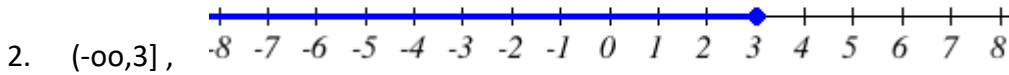
23.

24. 54, 36, 14, 0, In time, the ant colony will no longer populate the house.

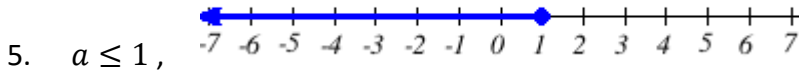
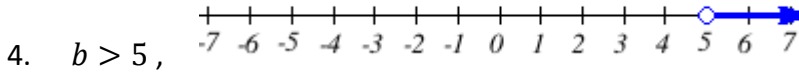
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### Lecture 17 Answers

1. 15



3.  $(-4, -3)$



6.  $x < -\frac{1}{3}$

7.  $-\frac{1}{4} < x < 1$

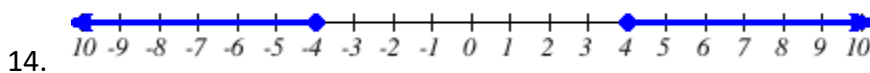
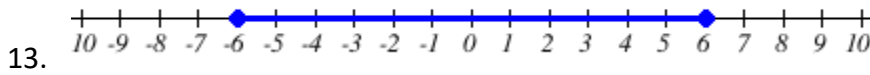
8.  $(-\infty, 130]$

9.  $x > 0$ ,  $x < 0$ ,  $x = 0$

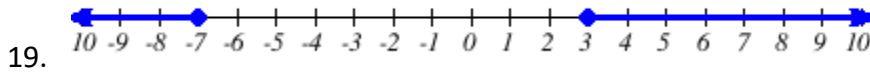
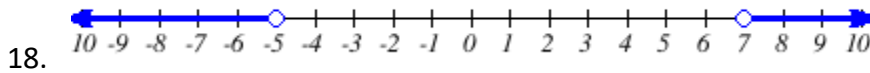
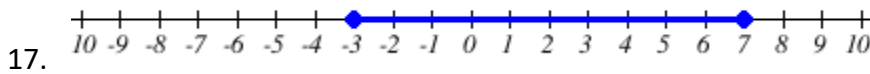
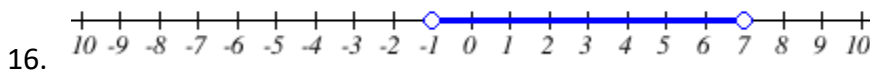
10.  $x < 1$ ,  $x > 1$ ,  $x = 1$

11.  $x > 2$

12. 20, Kimberly,  $[0, 4)$



15.  $(-\infty, -\frac{2}{3}] \cup [\frac{5}{3}, \infty)$



20.  $[-\frac{8}{3}, -\frac{1}{3}]$

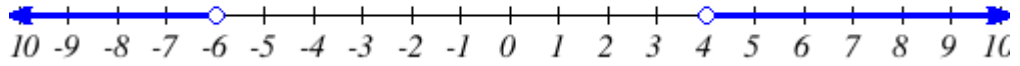
21.  $(-\infty, -\frac{3}{4}] \cup [\frac{3}{2}, \infty)$

22. DNE

23.  $(-\infty, \infty)$

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### Lecture 18 Answers

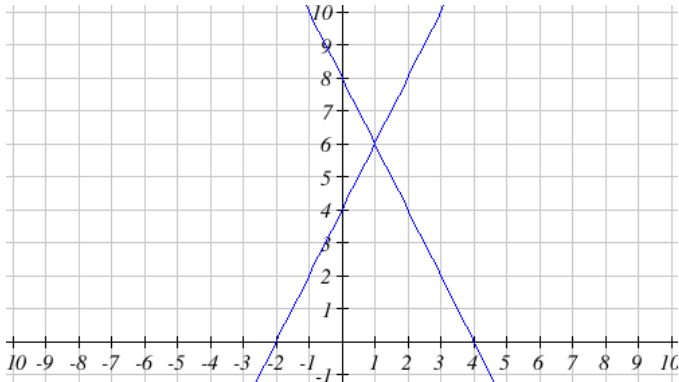


1.  $x < -6$  or  $x > 4$ ,
2.  $(-\infty, 3] \cup [4, \infty)$
3.  $(-\infty, -6) \cup (3, \infty)$
4.  $(-\infty, -2) \cup (\frac{1}{3}, \infty)$
5.  $(-\infty, \infty)$
6.  $[2 - \sqrt{2}, 2 + \sqrt{2}]$
7.  $(-\infty, -5) \cup (-4, 6)$
8.  $[-8, 9]$
9.  $(-\infty, -7] \cup [0, \infty)$
10.  $(-5, 2) \cup (2, 4)$
11.  $(-\infty, -4) \cup (-2, 2) \cup (4, \infty)$
12.  $(-\infty, -8) \cup (-\frac{15}{2}, \infty)$
13.  $(-\infty, \frac{1}{7}) \cup [\frac{7}{6}, \infty)$
14.  $(-\infty, -3] \cup (6, \infty)$
15.  $(-\infty, -1) \cup (-\frac{1}{2}, \infty)$
16.  $(-7, 3) \cup (7, \infty)$
17.  $(-\infty, -6) \cup (4, 6)$
18.  $(-\infty, -5) \cup (-5, 3] \cup [4, \infty)$
19.  $(0, 4) \cup (7, \infty)$
20.  $(-\infty, 0] \cup [2, 3)$
21.  $(-5, 1) \cup (3, \infty)$
22.  $[-12, 1) \cup [4, \infty)$

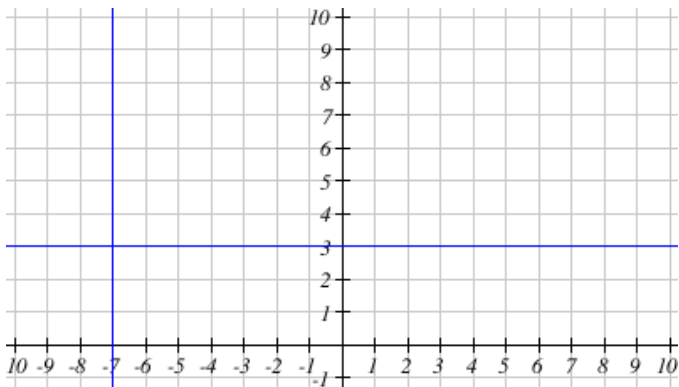
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### Lecture 19 Answers

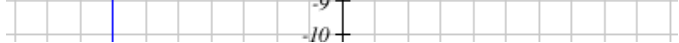
1. An ordered pair that makes both equations true.
2. True
3.  $(-1,5)$

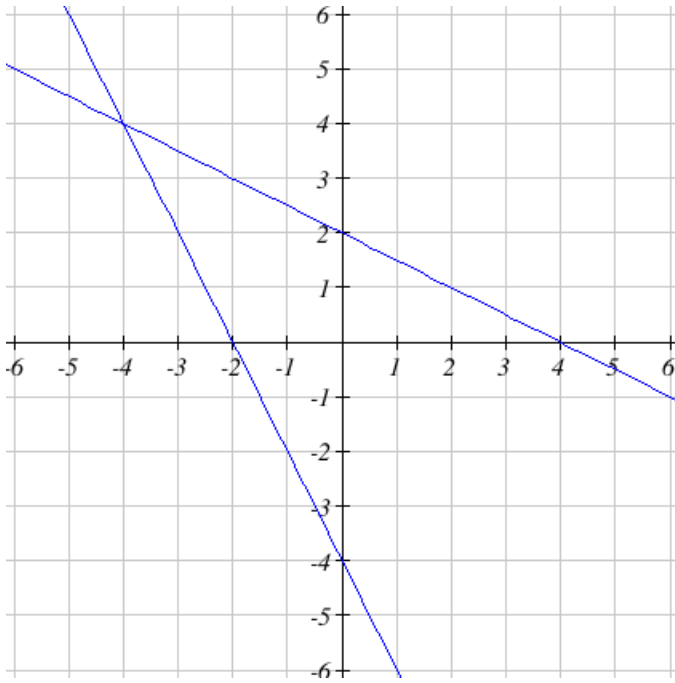


4.  $(1,6)$



5.  $(-7,3)$





6.  $(-4, 4)$
7. An infinite number of solutions. , This is a consistent system. , The equations are dependent.
8. an infinite number of solutions.
9.  $-4 \cdot x - 4$  ,  $-4 \cdot x - 4$  , Consistent-dependent
10.  $(4, 3)$
11.  $-2$  ,  $-6$
12.  $0$  ,  $-2$
13.  $(-4, 3)$
14.  $-3.2$  ,  $-3.6$
15. Infinite number of solutions
16.  $(6, 2)$
17.  $(5, 0)$
18. No solution
19. 15
20. 164 , 200
21.  $x + y = 8200$  ,  $0.06x + 0.09y = 600$  , 4600 , 3600
22.  $\begin{cases} x + y = 800 \\ 8x + 4y = 5000 \end{cases}$
23. 9 , 5
24. 500 , 1500
25.  $(-\sqrt{3}, -\sqrt{2})$  ,  $(-\sqrt{3}, \sqrt{2})$  ,  $(\sqrt{3}, -\sqrt{2})$  ,  $(\sqrt{3}, \sqrt{2})$
26.  $(-2, 1)$  ,  $(0, 5)$
27.  $(-4, -3)$  ,  $(4, -3)$
28. 2 , 1
29.  $(-1, 0)$  ,  $(1, 0)$
30.  $-1$  ,  $-3$  ,  $3$  ,  $1$
31. 15 , 10
32. There are many possible solutions