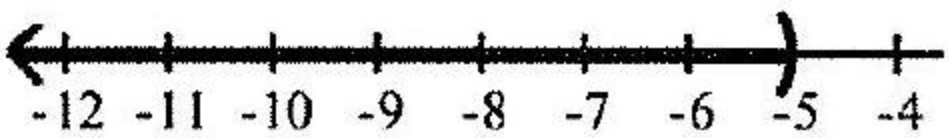
Math 120 Final Review
Addendum to Answer Key - Fall Semester 2017

5. It is a Conditional Equation and the Solutions Set is $\left\{-\frac{27}{40}\right\}$
6. Increasing: $(-\infty, -5)$; Constant: $(-5, 0)$; Decreasing: $(0, \infty)$
7. Domain: $[-4, \infty)$; Range: $[0, \infty)$
8. Domain: $[-1, \infty)$; Range: $(-\infty, -2)$
9. Domain: $(-\infty, \infty)$; Range: $[-2, \infty)$
10. Domain: $(-\infty, \infty)$; Range: $(-\infty, \infty)$
11. Domain: $(-\infty, \infty)$; Range: $[-3, \infty)$
12. y-axis symmetry; even function
13. Origin symmetry; odd function
14. Three or one potential positive zeros; Zero potential negative zeros

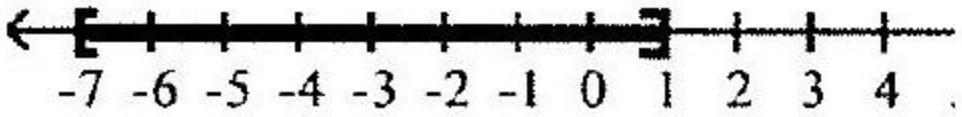
85) Axis of symmetry: $x = -4$; vertex: $(-4, -3)$; y -axis intercept: $(0, 13)$; x -axis intercepts $(-4 + \sqrt{3}, 0), (-4 - \sqrt{3}, 0)$; Domain: $(-\infty, \infty)$; Range: $(-3, \infty)$
86) Axis of symmetry: $x = -7$; vertex: $(-7, -6)$; y-axis intercept: $(0, -114)$; x-axis intercepts: none; Domain: $(-\infty, \infty)$; Range: $(-\infty, -6)$
87)x-axis intercept: $(-1, 0)$; y-axis intercept: $\left(0, -\frac{1}{3}\right)$;
88) Zeros: $\frac{1}{3}, 2, -2$; y-axis intercept: $(0, 4)$
91) Vertical Asymptote: $x = -1, x = 3$, Horizontal Asymptote: $y = 0$
92) Vertical Asymptote: $x = \frac{5}{4}$; Horizontal Asymptote: $y = \frac{9}{4}$
93) Vertical Asymptote: $x = -3, x = 3$, Horizontal Asymptote: $y = 0$
95) Vertical Asymptote: $x = -7$; Slant Asymptote: $y = x - 12$

1. $W = \frac{P - 2L}{2}$
2. $y = \frac{7x - 5}{8}$
3. $n = \frac{R}{E - r}$
4. 300 items

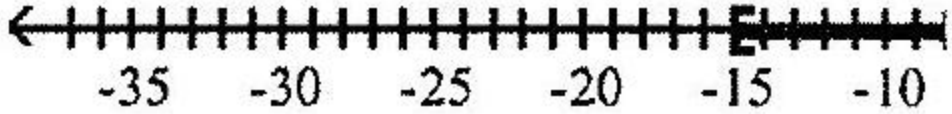
5. Conditional equation
6. Identity; {all real numbers}
7. Contradiction; $\varnothing$
8. -5
9. 194°F
10. 1.5 L
11. 20 mL of 17%; 110 mL of 82%
12. 50 mph
13. $\$202.91$; $\$4711.91$
14. $\left\{\frac{5}{3}, -4\right\}$
15. $\{7 \pm \sqrt{3}\}$
16. $\left\{\frac{-3-\sqrt{7}}{2}, \frac{-3+\sqrt{7}}{2}\right\}$
17. 1.5 and 6.5 sec
18. 25 mi
19. 80 mi
20. $\$30,000$
21. $\$31,000$
22. 7 i
23. -5
24. $-2\sqrt{2} - \text{i}$
25. $-4 - 3\text{i}$
26. $64 - 50\text{i}$
27. $\frac{8}{39} + \frac{25}{39}\text{i}$
28. $20 - 48\text{i}$
29. $\{-9, 2\}$
30. $\{-2, 12\}$
31. $\left\{-\frac{4}{7}, -\frac{5}{2}\right\}$
32. $\left\{\frac{-5-\sqrt{11}}{7}, \frac{-5+\sqrt{11}}{7}\right\}$
33. $\left\{-\frac{7}{16} \pm \frac{\sqrt{15}}{16}\text{i}\right\}$
34. $\{-4, 2 \pm 2i\sqrt{3}\}$
35. $\{5\}$
36. $x \neq 3; \{-2\}$
37. $(-\infty, -5)$



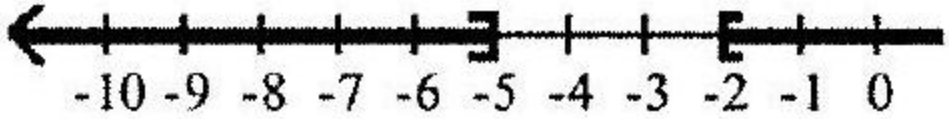
38. $\left\{\frac{15}{2}, \frac{1}{2}\right\}$
39. $[-7, 1]$



40. [-15, 19]



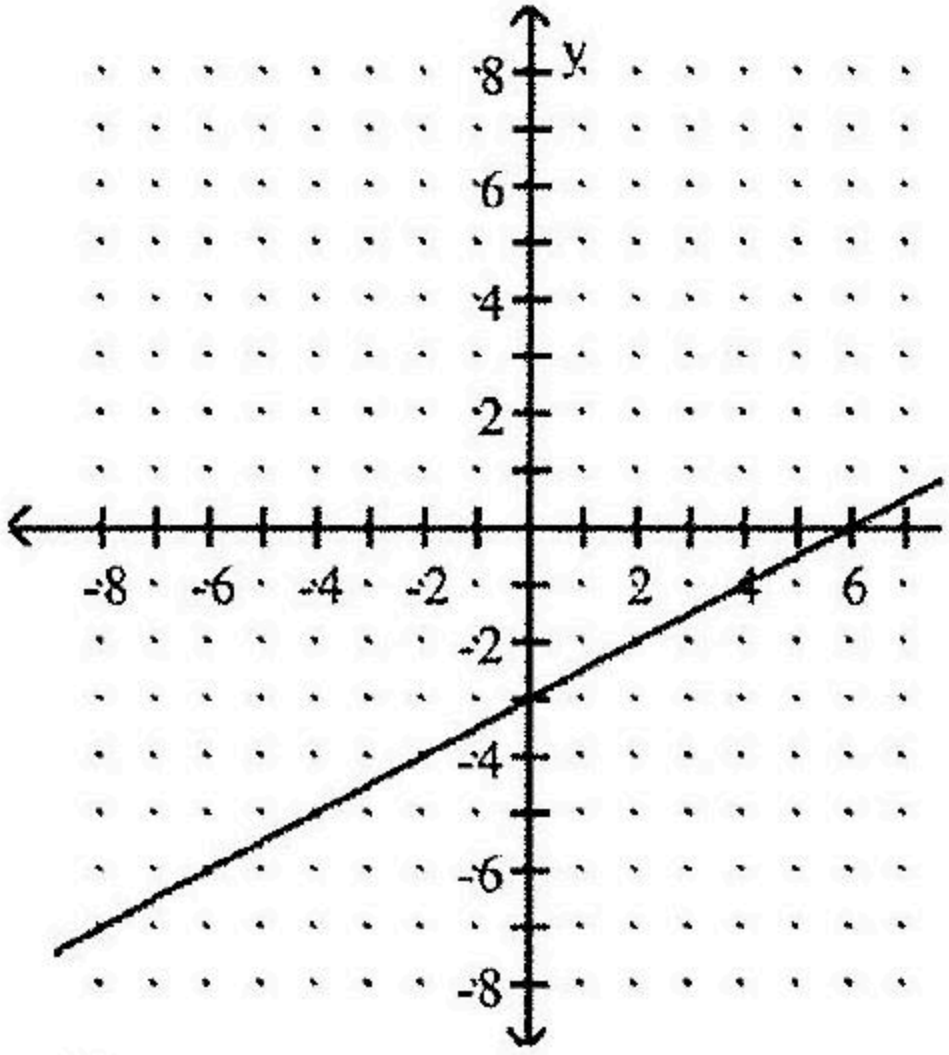
41. $\left(-\infty, -\frac{9}{8}\right) \cup \left(\frac{3}{8}, \infty\right)$
42. $(-\infty, -5] \cup [-2, \infty)$



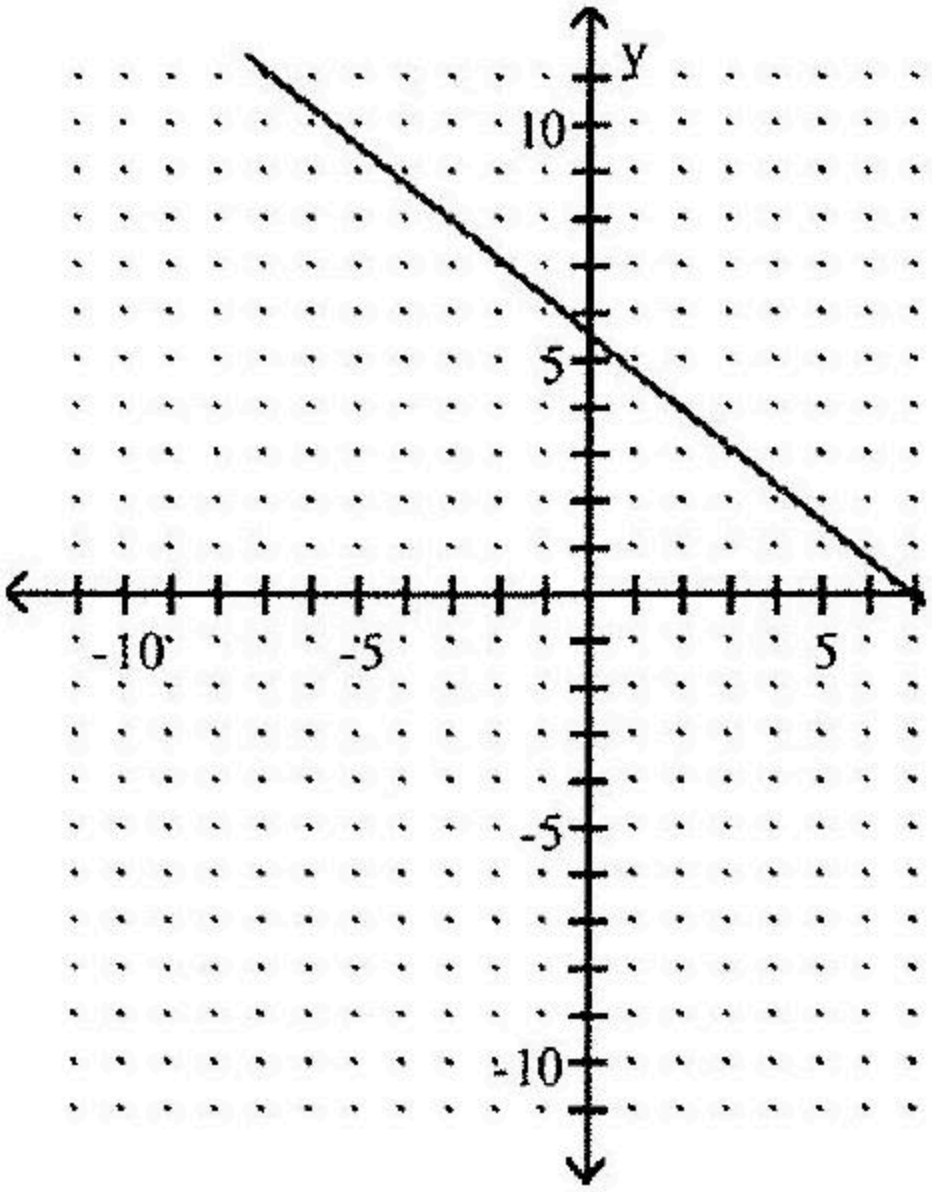
43. $\sqrt{145}$
44. $(x+5)^2 + (y-3)^2 = 2$
45. $(6, 3)$
46. center: $(-2, 8)$; radius: 9
47. center: $(2, -1)$, radius: 3
48. domain: $\left[\frac{3}{5}, \infty\right)$; range: $[0, \infty)$
49. domain: $(-\infty, 7) \cup (7, \infty)$; range: $(-\infty, 0) \cup (0, \infty)$
50. 19
51. $4k^2 - 5k - 5$
52. 10
53. Increasing

Decreasing

54) $D = (-\infty, \infty), R = (-\infty, \infty)$



55) $-\frac{3}{13}$
56) $y = \frac{7}{2}x + \frac{39}{2}$
57) $y = \frac{7}{9}x - \frac{37}{9}$
58) -53
59) $m = -\frac{4}{5}$

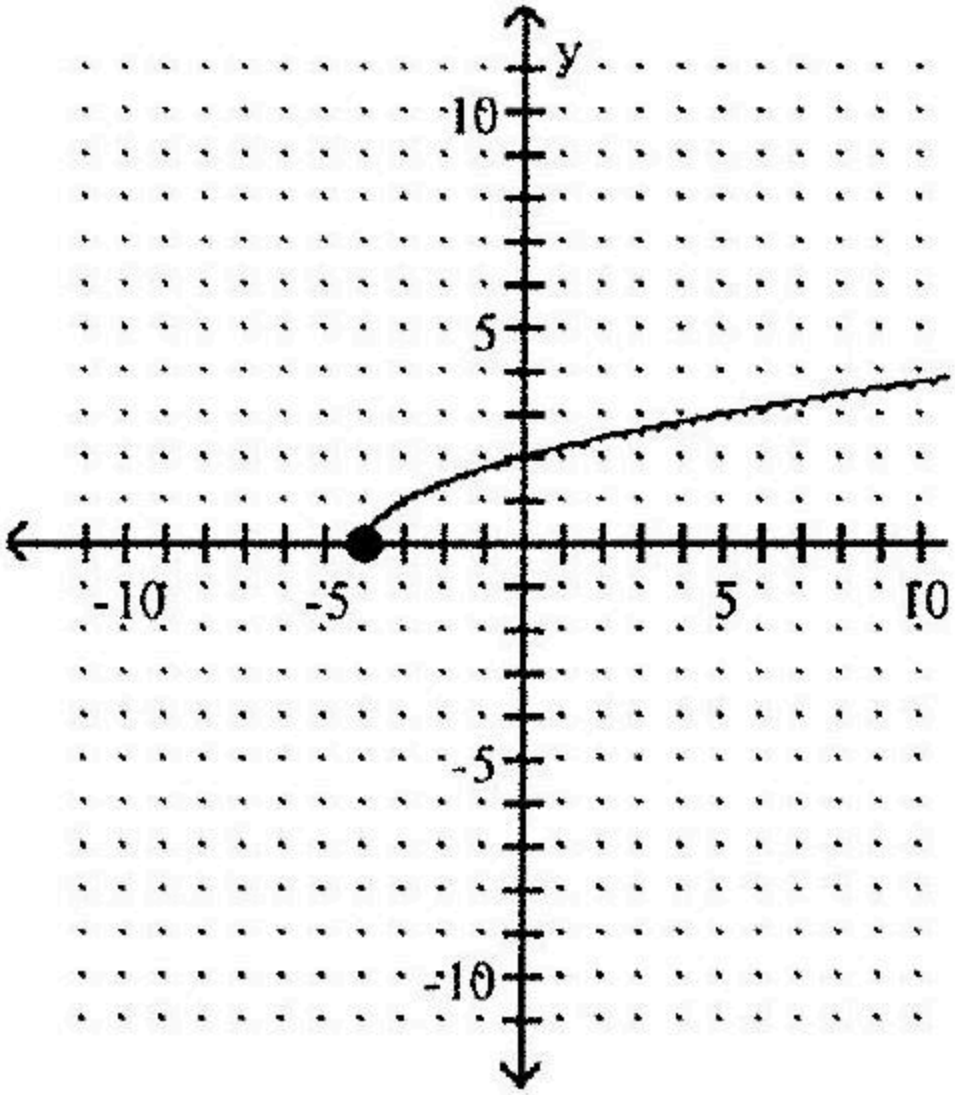


60) $y = \frac{1}{3}x - 2$

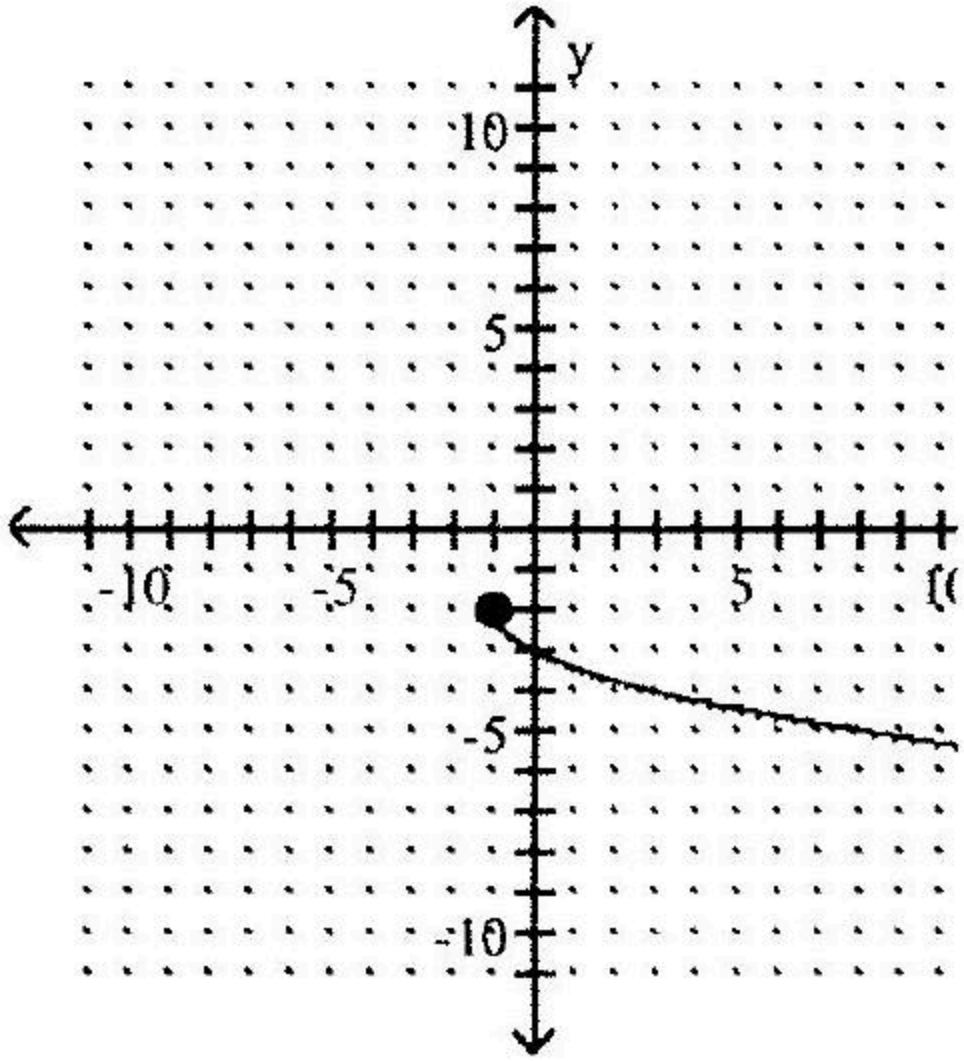
61) a translation 4 units to the right and 8 units up

62) vertical shrinking by a factor of $\frac{1}{3}$ and a translation 7 units down

63)

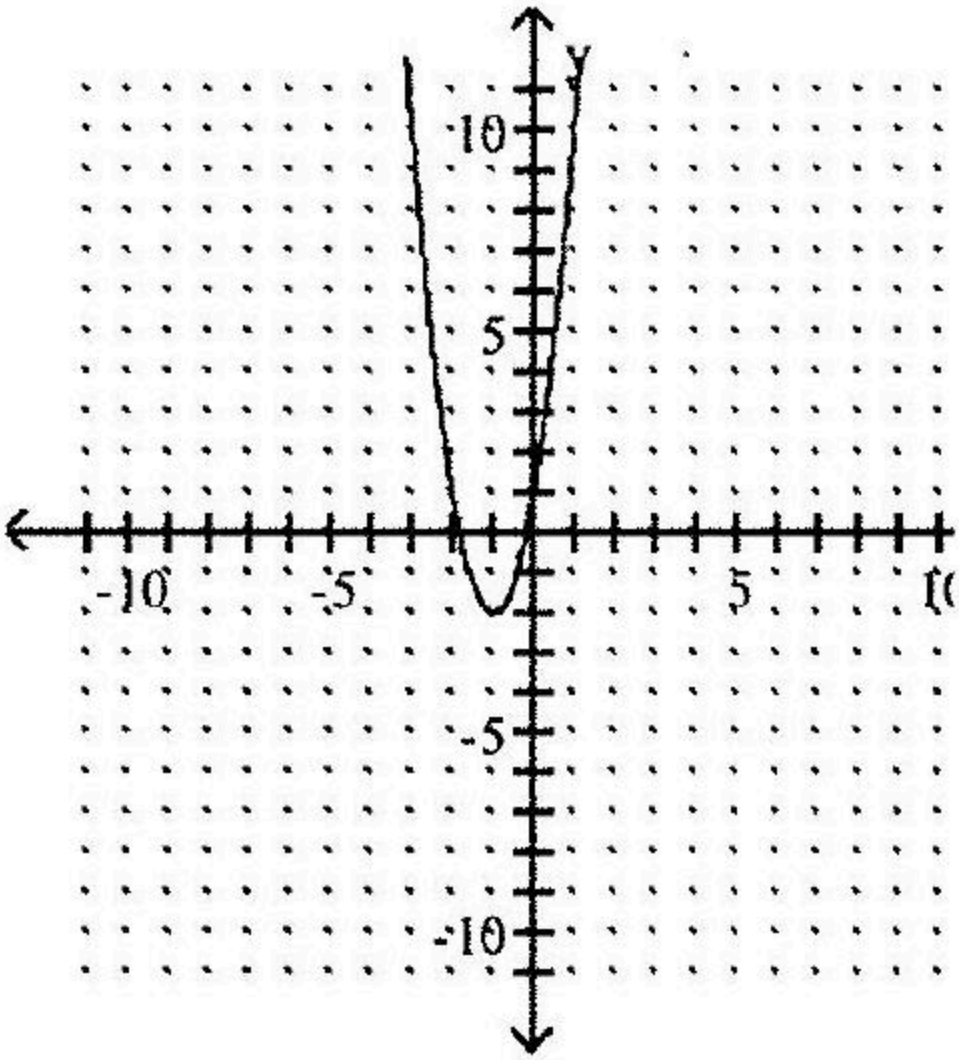


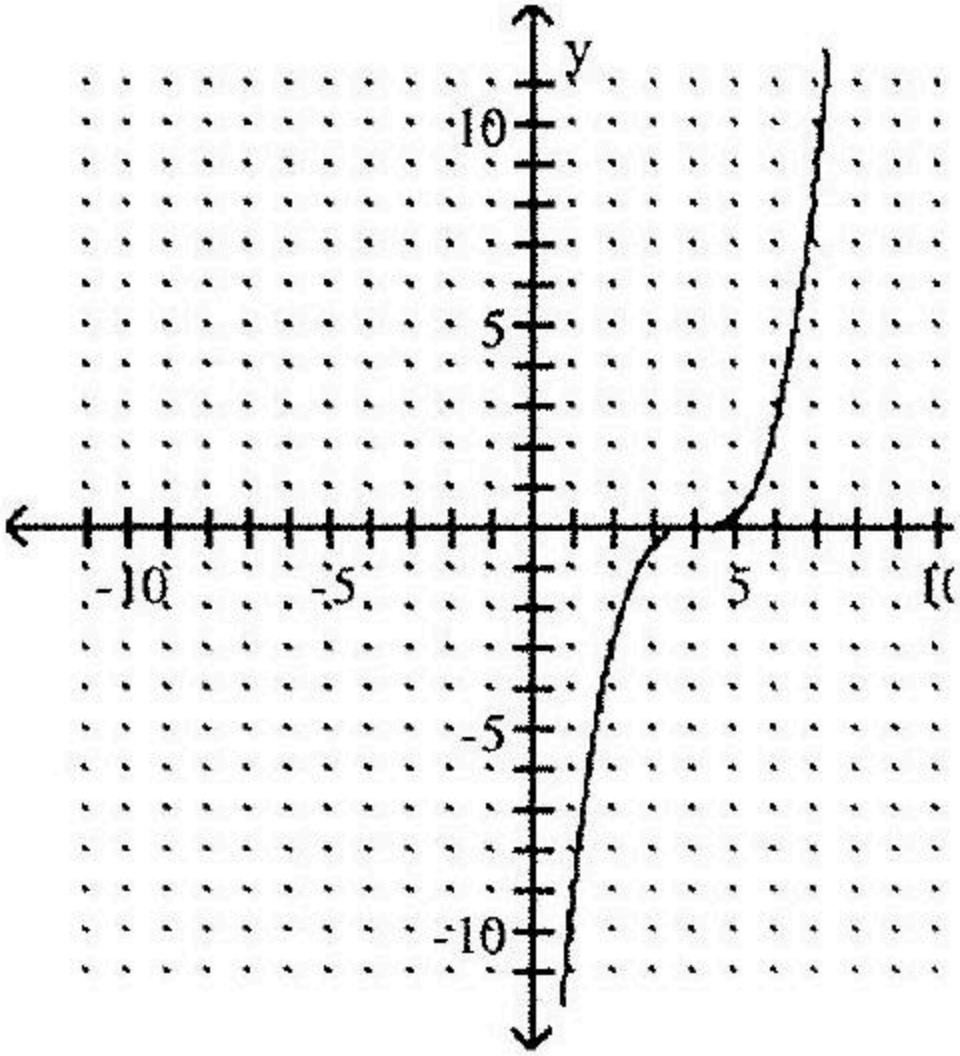
64)



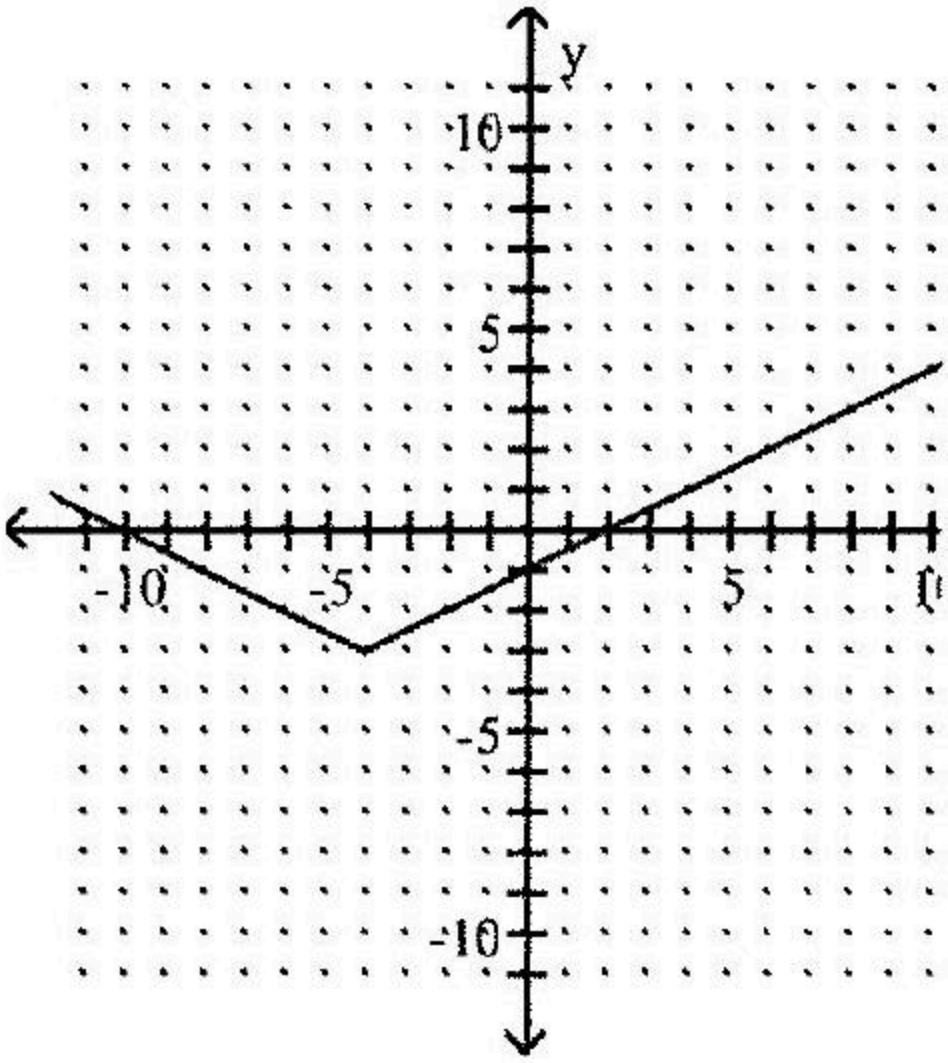
65)

66)


y
10
5
-10
-5
5
-5
-10

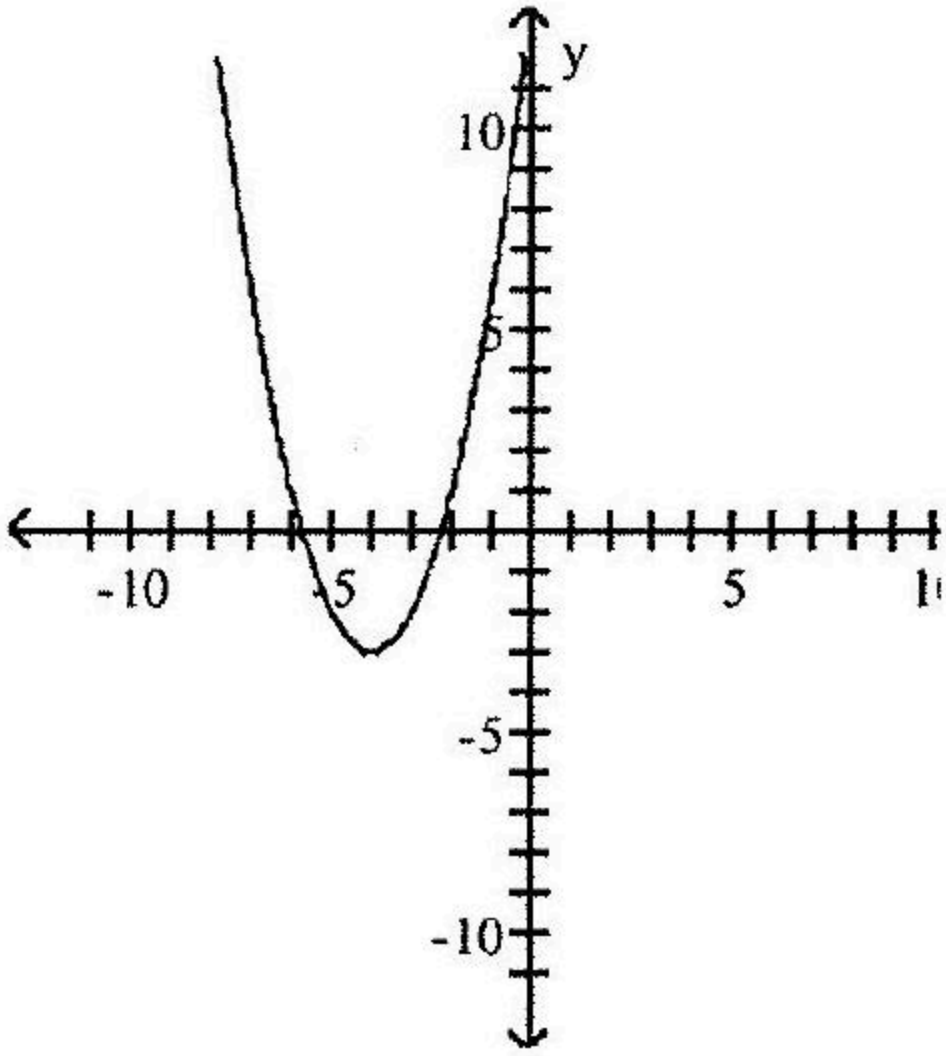


67)

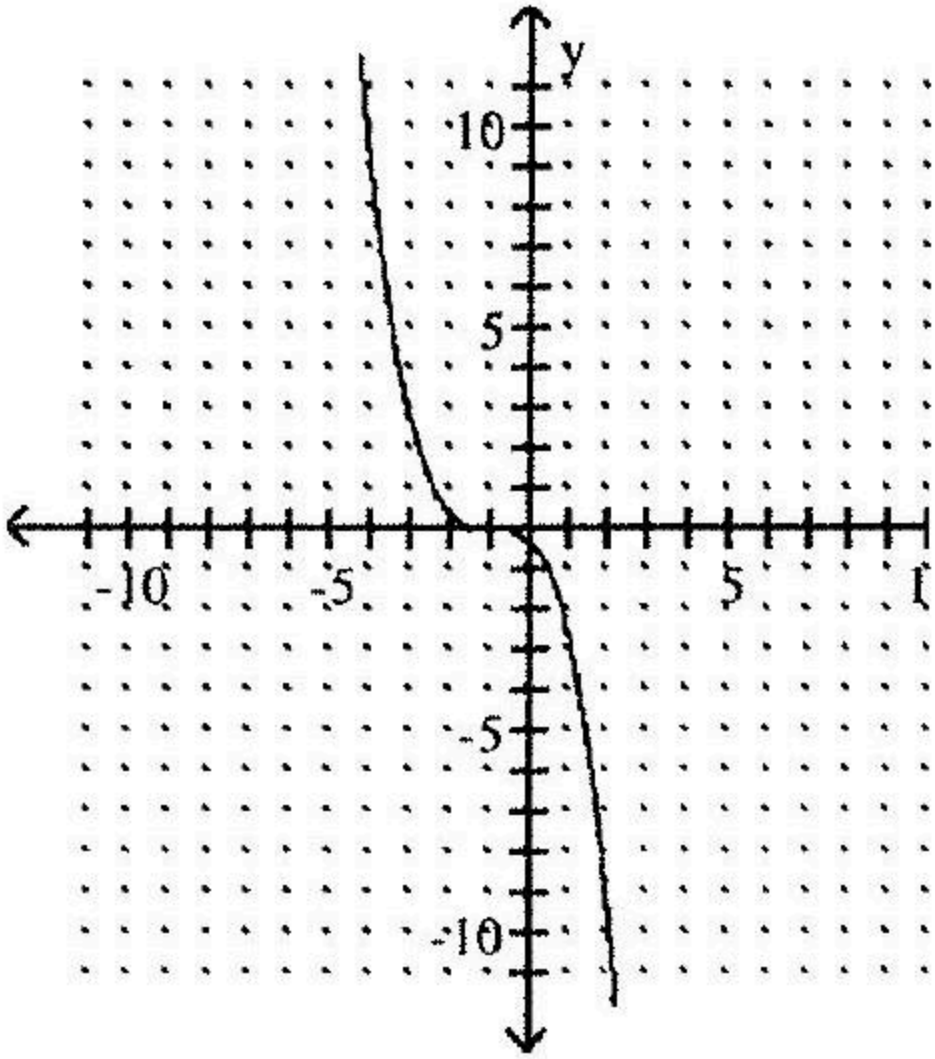


68) y-axis only
69) origin only
70) $y = -3x + 115$
71) $(3, 2)$
72) $x^2 - 3x + 6 + \frac{-8}{x+2}$
73) $4x^2 + 5x + 2$
74) -12
75) -37
76) $(x - 6)(x - 2)(x + 6)$
77) $\mathrm{f(x)} = (\mathrm{x} + 2)^2(\mathrm{x} - 4)$
78) $\pm 1, \pm 3, \pm \frac{1}{2}, \pm \frac{3}{2}$
79) -2 (multiplicity 3), 0 (multiplicity 2), 6 (multiplicity 1)

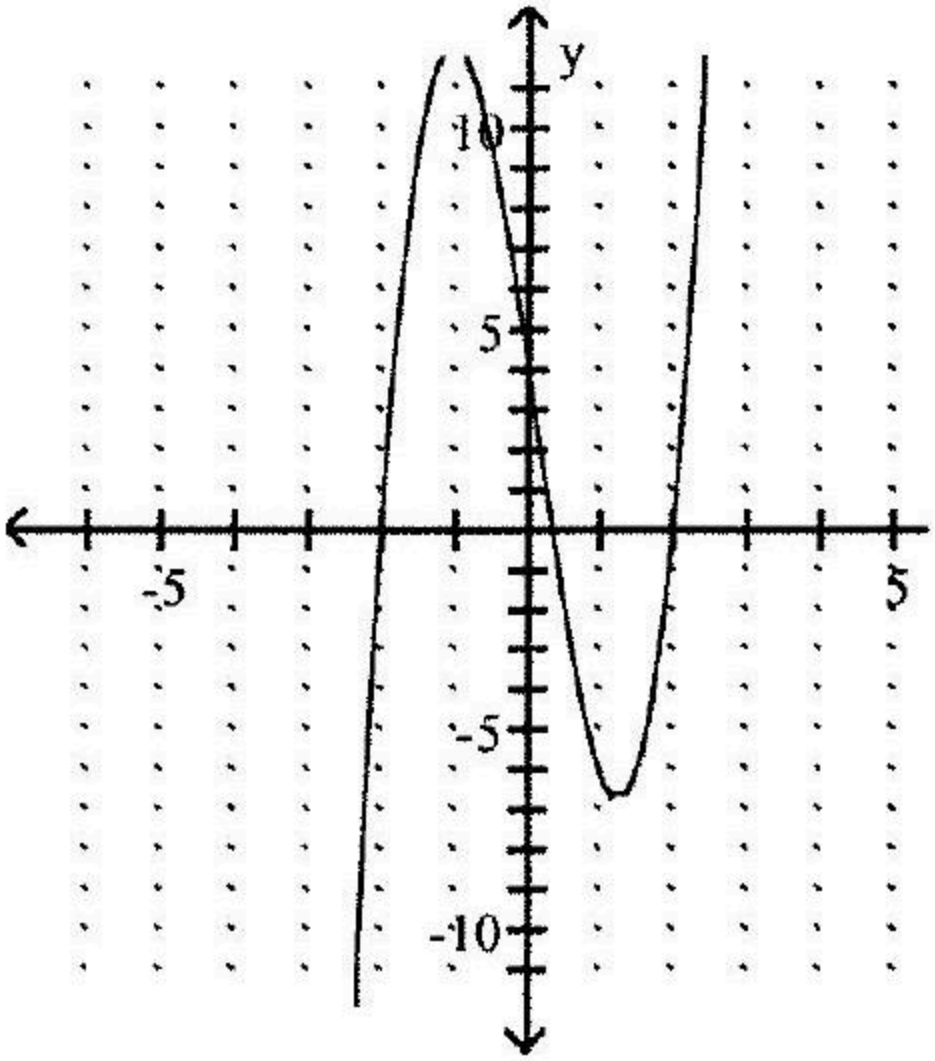
80) $5, 1 + 2i, 1 - 2i$
81) 4
82) ^{4}
83) $\leftarrow$
84) rises to the left and rises to the right
85)



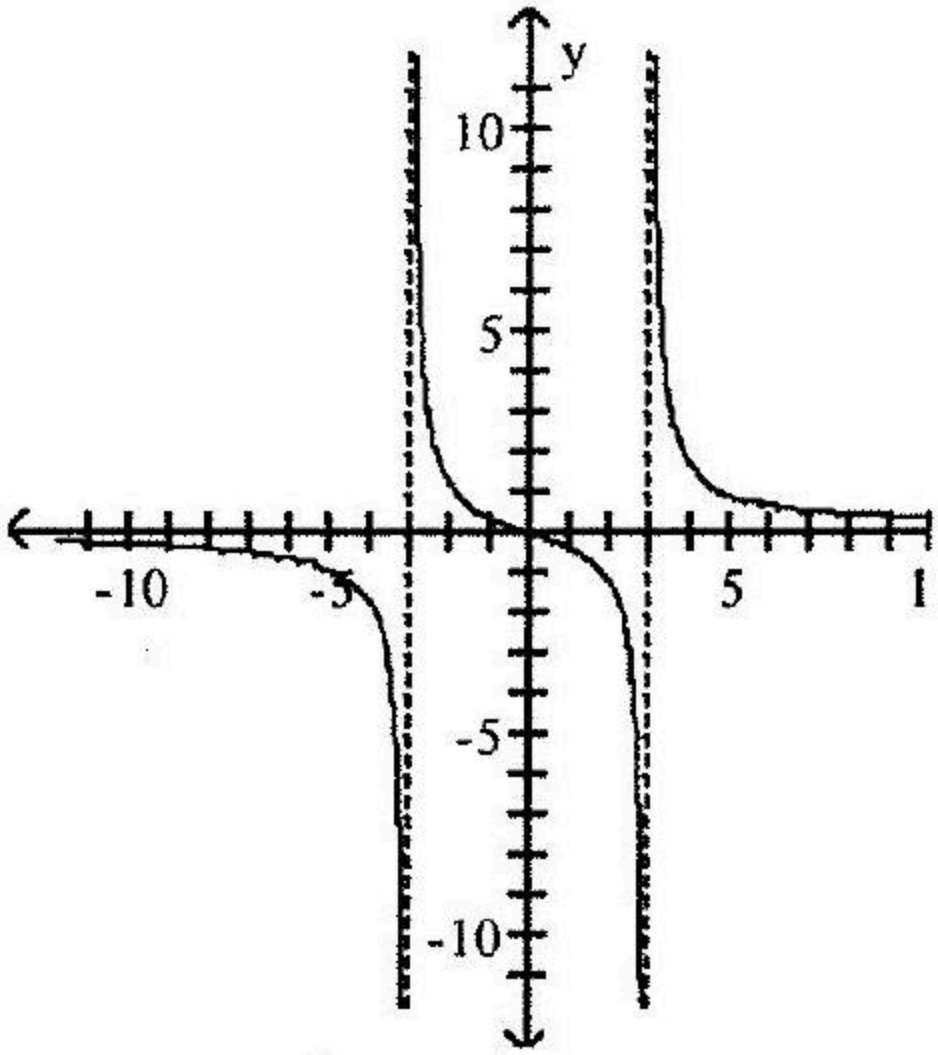
86)
87)



88)



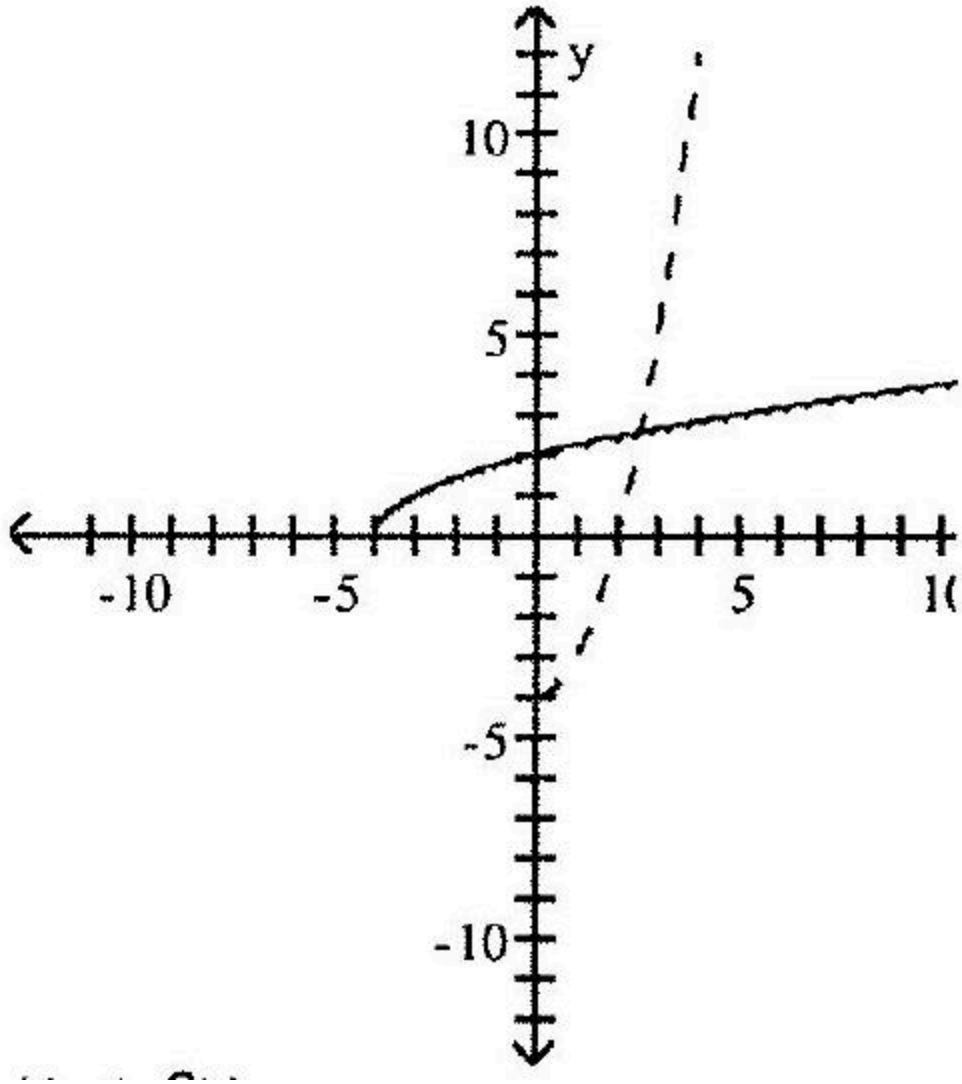
89) $f(1) = -2$ and $f(2) = 31$
90) $f(x) = \frac{1}{6}(x+3)(x-1)(x-4)$
91) $x = 3, x = -1$
92) $y = \frac{9}{4}$
93)



94) $P(x) = -3x^3 + 9x^2 - 3x + 9$
95) $y = x - 12$

Answer Key
Testname: 2017 - FALL MATH 120 CUMULATIVE REVIEW
96) 19
97) 0
98) $-\frac{22}{57}$
99) -12
100) $4x + 2$
101) $32x^2 - 12x - 2$
102) $x\sqrt{6x - 9}$
103) 5
104) 4
105) $4\mathrm{x} + 2\,\mathrm{h} + 7$

106) 5
107) 16
108) $21x + 5$
109) $f^{-1}(x) = \frac{x-3}{2}$
110) $f^{-1}(x) = \sqrt{\frac{x+9}{6}}, x \geq -9$
111)



112) $\{(-6, 3)\}$
113) $x = 5, y = -2$
114) $\{(7, -6)\}$
115) $x = 10, y = -3$
116) inconsistent
117) $y = -4x + 2$, where x is any real number
118) 2

119) $\{(3, -6)\}$
120) Cramer's rule does not apply since $\mathrm{D} = 0$; $\varnothing$
121) Cramer's rule does not apply since $\mathrm{D} = 0$; $\{(4 - \mathrm{y}, \mathrm{y})\}$
122)
$\begin{bmatrix} 5 & 3 \\ 7 & 3 \end{bmatrix}$
123) They cannot be added.
124)

$$\begin{bmatrix} -12 & -20 \\ 4 & 3 \end{bmatrix}$$

125.

$$\begin{bmatrix} 4 & 16 \\ 7 & 26 \end{bmatrix}$$

126.

$$\begin{bmatrix} 3 & -7 & -1 \\ 2 & -16 & 39 \end{bmatrix}$$

127.

$$\mathrm{AB} = \begin{bmatrix} -10 & -9 \\ 15 & 8 \end{bmatrix}; \mathrm{BA} = \begin{bmatrix} -4 & -3 \\ 21 & 2 \end{bmatrix}$$