

**Review Problems for
the SVSU Algebra
Placement Exam**

(Revised July 2007)

Simplify each expression.

- | | | |
|--|--|---|
| 1. $-3 + 7 - 2 + 8 - 9 - 4 + 6$ | 13. $-6(-2 + 5)^2$ | 25. $-2xy^2(3x + 4y + 2xy)$ |
| 2. $8 - 5 - 3 + 6 + (-9) - 2 + 8 - 7$ | 14. $11 - 3 \cdot 6 + 7^2 - 42$ | 26. $2a(3a^2 - 4a + 9) - 3a^2(4a - 2)$ |
| 3. $-(-3) - 6 + (-2) - 4 + 8$ | 15. $5^2 - 3^2 \cdot 4 + 7 - 2 \cdot 8$ | 27. $\frac{x^5y^3}{xy}$ |
| 4. $-3 + [-2 + 6 - 3 - (-2 - 4)]$ | 16. $4(3 + 5^2 - 18) - [-2(3 + 5^2) - 12]$ | 28. $\frac{6x^7y^3}{8x^2y^6}$ |
| 5. $-2 + (-3 + 5) - (-2 - 7)$ | 17. $-2[-3(-4 + 9 - 3^2)]$ | 29. $\left(\frac{10x^2y^7}{8x^3y^9}\right)^2$ |
| 6. $2x - 3x + 8x - 4x + 7x$ | 18. $(3x^2)(2xy^2)$ | 30. $\frac{10x^2y^5 + 6x^4y^3}{2x^3}$ |
| 7. $2y - 4y - 7y^2 + 8y + 11y^2$ | 19. $(3a^2b)^3(4ab^2)$ | 31. $\frac{12x^3y^7 - 4x^4y^3}{4x^2y^2}$ |
| 8. $7a^2 - 3a - 4a^2 + 9a - 2$ | 20. $(-3x^2yz)(-5xy^3z^5)$ | 32. $\frac{15x^3y^9 - 3x^3y^2}{3x^3y^2}$ |
| 9. $7a - 3b + 4b + 5a - 6b$ | 21. $6x + 3(2x - 5) + 7 - 4x$ | |
| 10. $4x + 3y - 7xy + 2x - 5y - 2xy$ | 22. $2x - 5y + 6(2x - 3y) + 7x$ | |
| 11. $5a + 3ab - 7b + 4 - 6ab + 2 + 5a$ | 23. $2x^3(3x^2 + 7x - 2)$ | |
| 12. $-3 \cdot 2 + 4 - 7 \cdot 5$ | 24. $4xy(3x + 7y + 2xy)$ | |

Evaluate each expression if $x = 3$, $y = -2$, and $z = -4$.

- | | | |
|-----------------|--------------------------|-------------------------|
| 33. xyz | 36. $x^2 - 3y + 2z$ | 39. $2[-3x + (2y - z)]$ |
| 34. $2xy + z$ | 37. $2x - 5y^2$ | |
| 35. $x - y - z$ | 38. $-2x + 3(x + y) - z$ | |

Solve each equation.

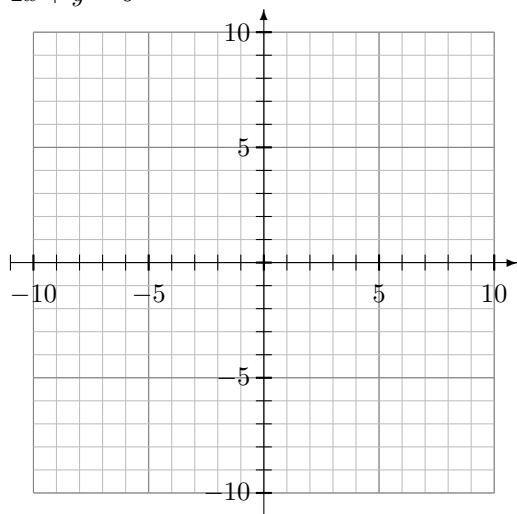
- | | | |
|-------------------------|-----------------------------|-----------------------------------|
| 40. $x + 7 = 2$ | 48. $\frac{-x}{4} = 10$ | 56. $2 = -2 - 3x + 5 - 4x$ |
| 41. $3x = 12$ | 49. $2x - 3 = 10$ | 57. $7x - 2 = 4x + 8$ |
| 42. $\frac{x}{5} = -2$ | 50. $6x + 2 = 13$ | 58. $3(2x + 7) = 18$ |
| 43. $2x - 7 = x + 2$ | 51. $16 = 5x - 2$ | 59. $9(2x - 3) = -20$ |
| 44. $15 = -5x$ | 52. $5 = 20 + 3x$ | 60. $4(2x - 3) + 5 = 11$ |
| 45. $\frac{x}{-3} = -6$ | 53. $6x + 4x - 3 = 20$ | 61. $7(2x - 3) + 5(-3x + 9) = 24$ |
| 46. $9 = -3 + x$ | 54. $9x + 3 = 2x + 6$ | |
| 47. $-9 = -4 + x$ | 55. $4x + 3 - 11x + 9 = 16$ | |

Find the value of each missing variable.

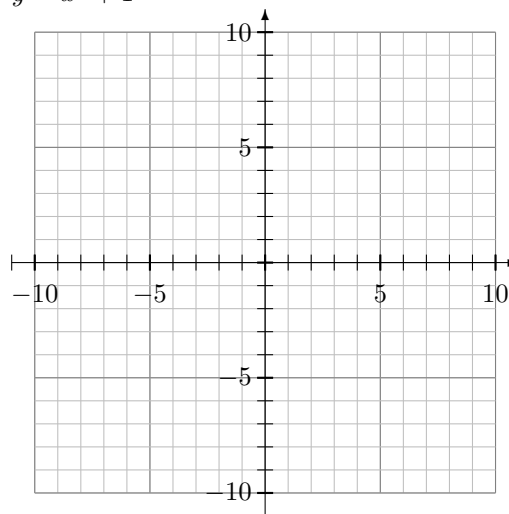
- | | |
|---|--|
| 62. $x = 2y + 3z$ if $y = -2$ and $z = 4$ | 65. $K = -\frac{3}{4}N - 7r$ if $N = 8$ and $K = 2$ |
| 63. $P = 2L + 2w$ if $P = 9$ and $w = 1$ | |
| 64. $I = \frac{2}{3}NP$ if $N = 9$ and $P = -2$ | 66. $L = \frac{4}{5}P - \frac{1}{2}N$ if $P = 20$ and $N = 18$ |

Graph the following equations without using a graphing calculator.

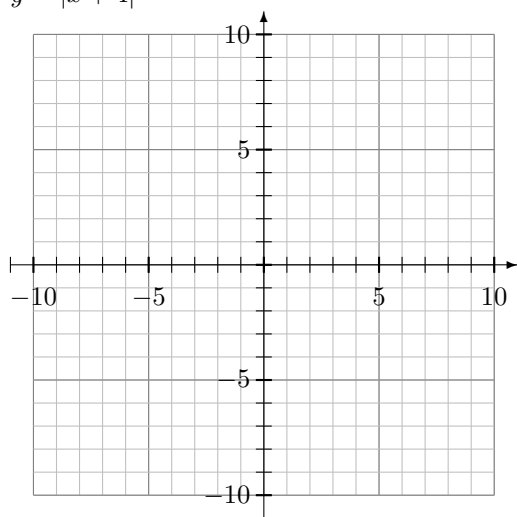
67. $2x + y = 6$



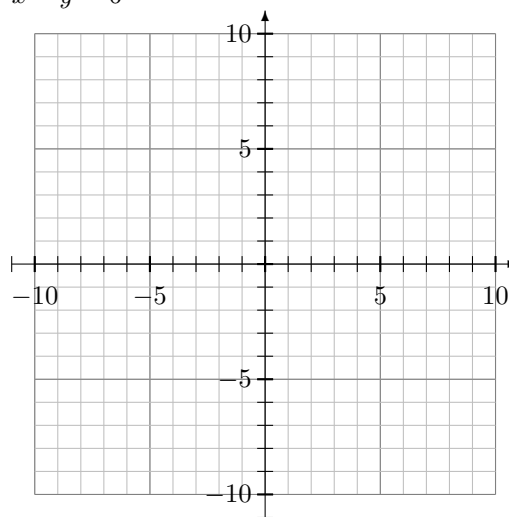
70. $y = x^2 + 1$



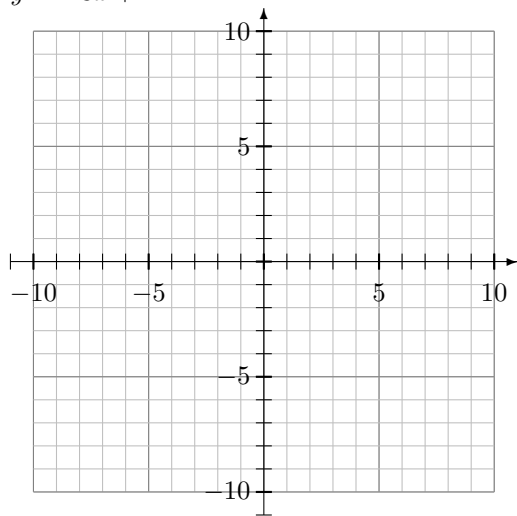
68. $y = |x + 4|$



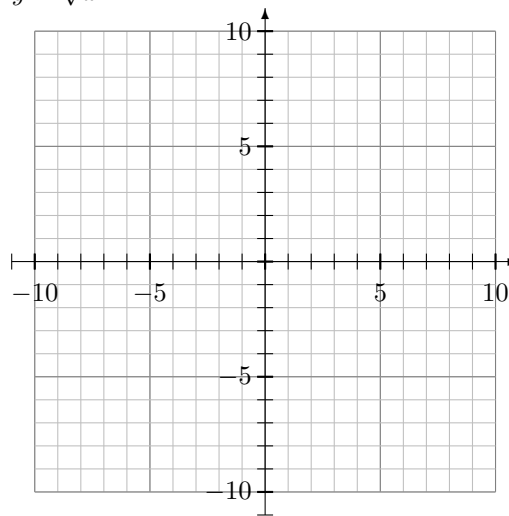
71. $x - y = 6$



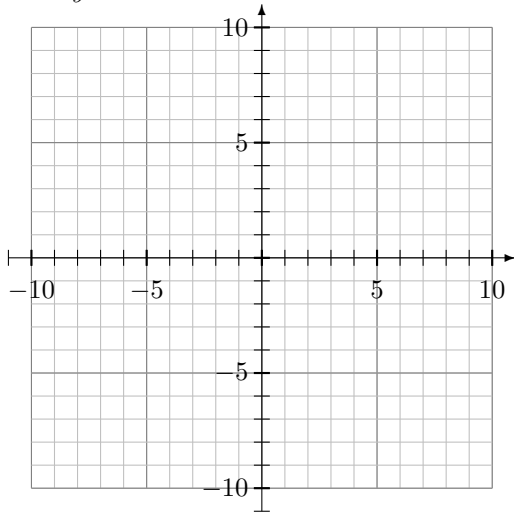
69. $y = -3x + 1$



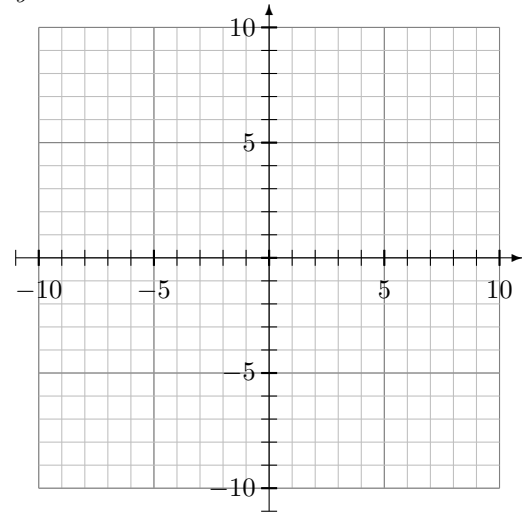
72. $y = \sqrt{x}$



73. $x = 2y + 3$

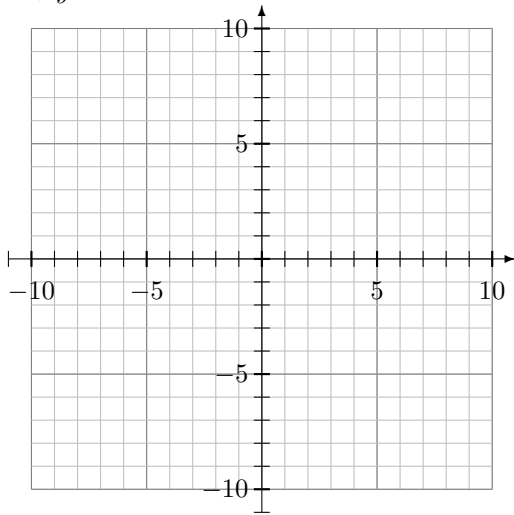


74. $y = -x^2$

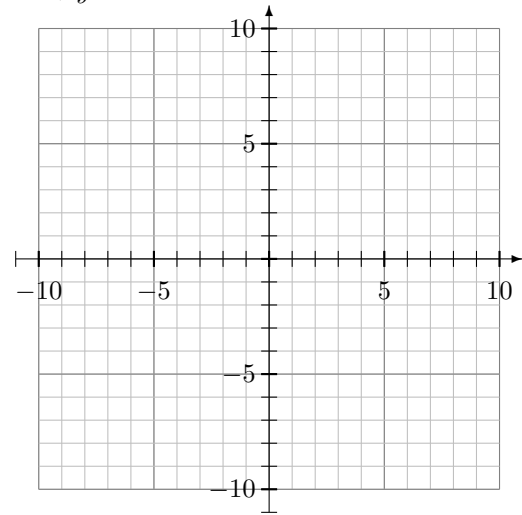


Graph the lines by finding the intercepts.

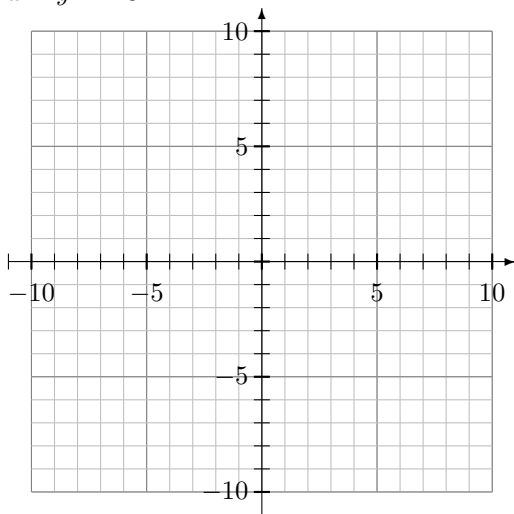
75. $x + y = 7$



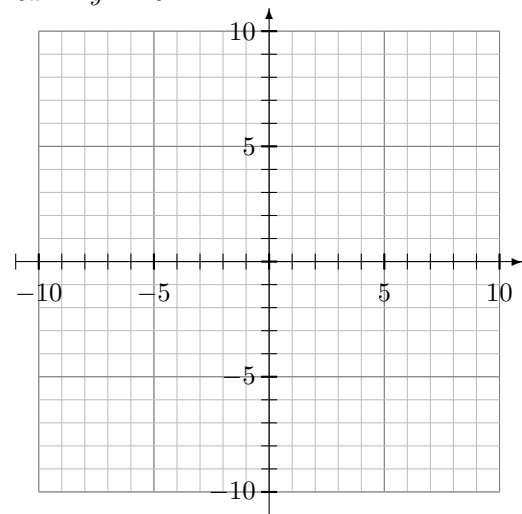
77. $3x + y = 9$



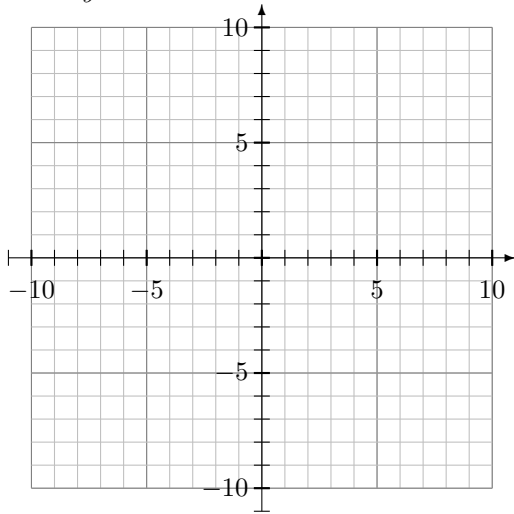
76. $x - y = -3$



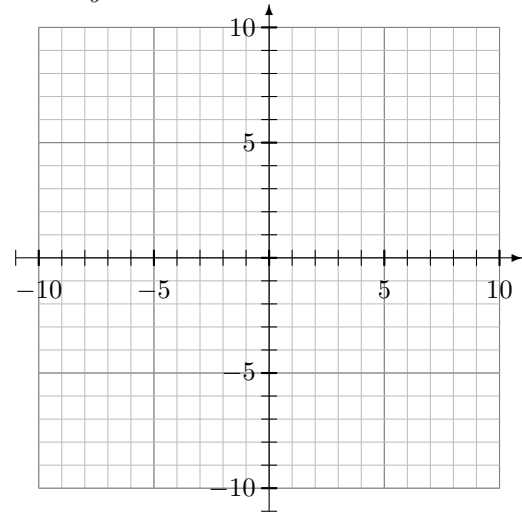
78. $5x - 2y = 10$



79. $2x + 3y = 6$

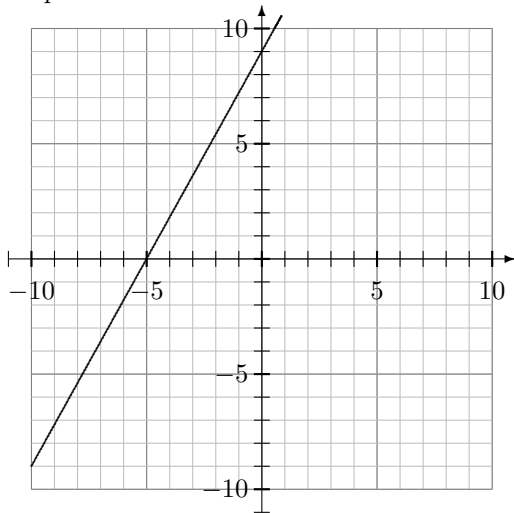


80. $3x + 4y = -12$

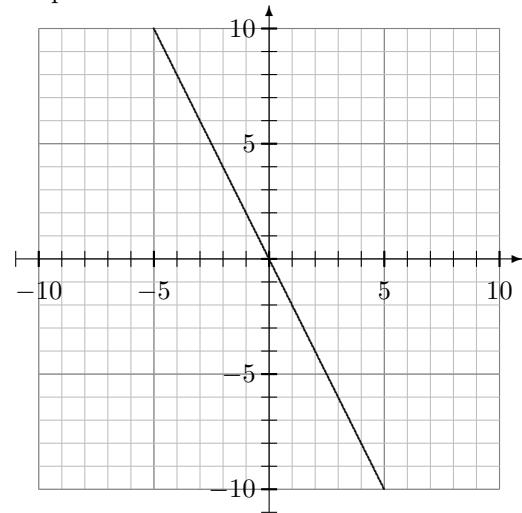


Find the slope of the graphed line.

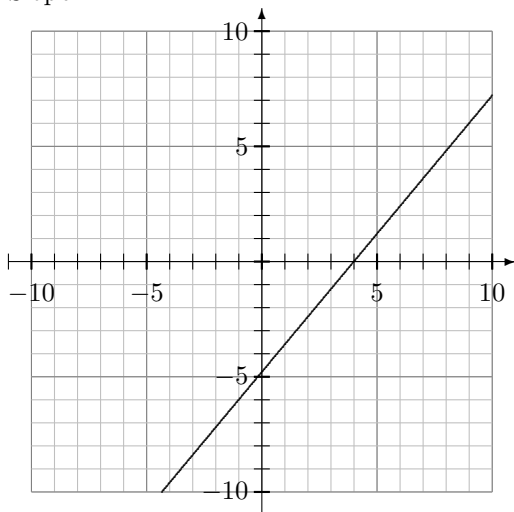
81. Slope:



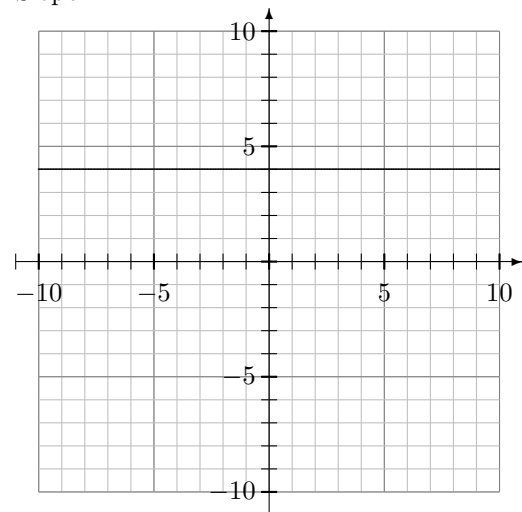
83. Slope:



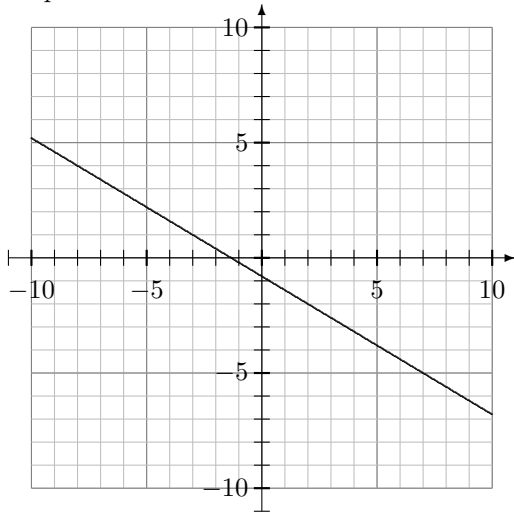
82. Slope:



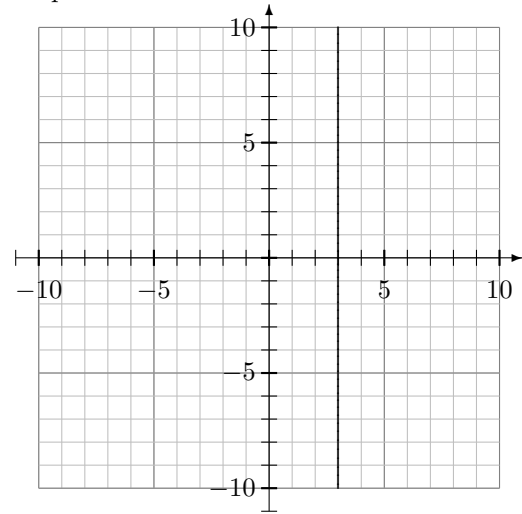
84. Slope:



85. Slope:



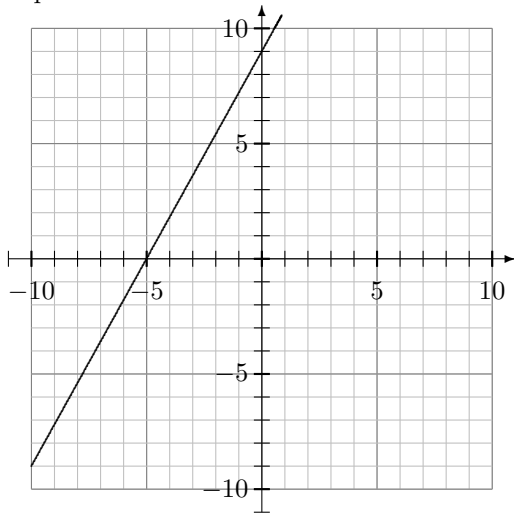
86. Slope:



Find the slope and y-intercept (if it exists) of each graphed line, and write its equation.

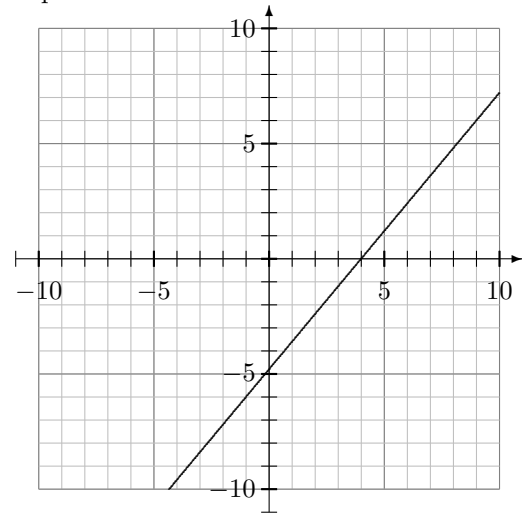
87. Slope: _____, y-intercept:

Equation:



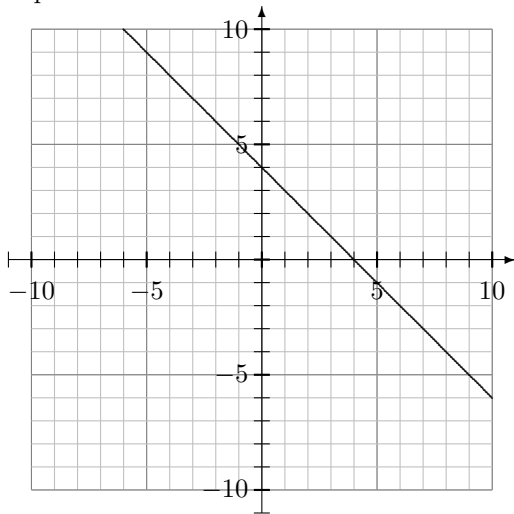
89. Slope: _____, y-intercept:

Equation:



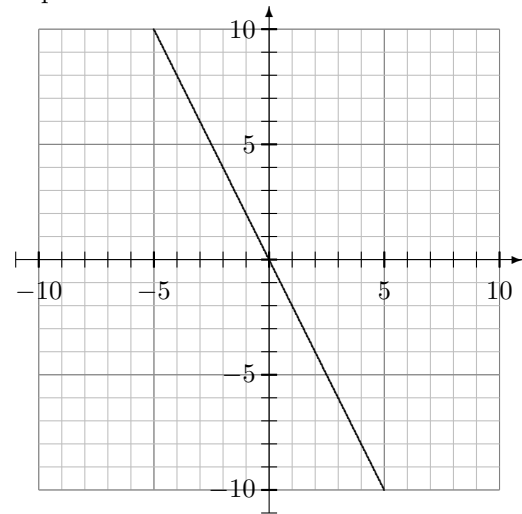
88. Slope: _____, y-intercept:

Equation:

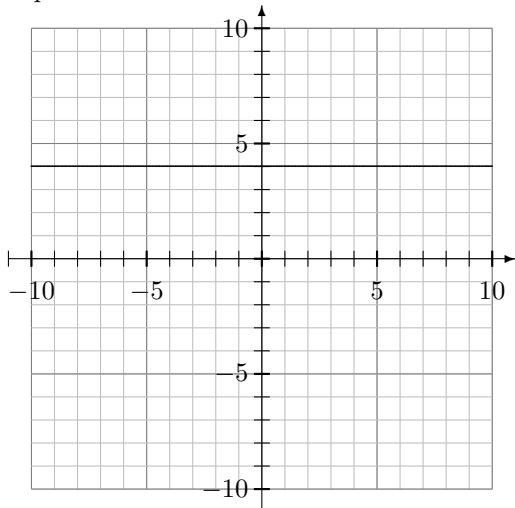


90. Slope: _____, y-intercept:

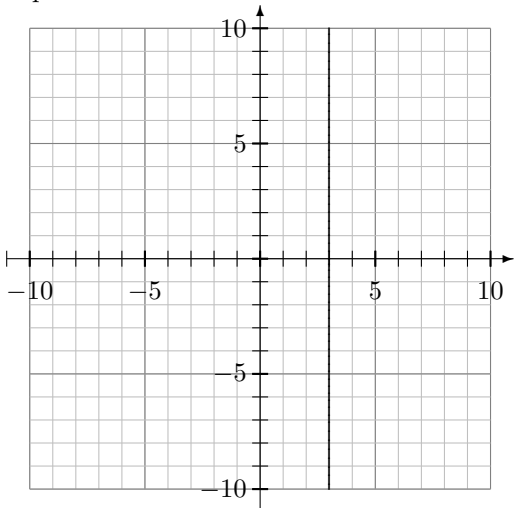
Equation:



91. Slope: _____, y-intercept: _____
Equation: _____

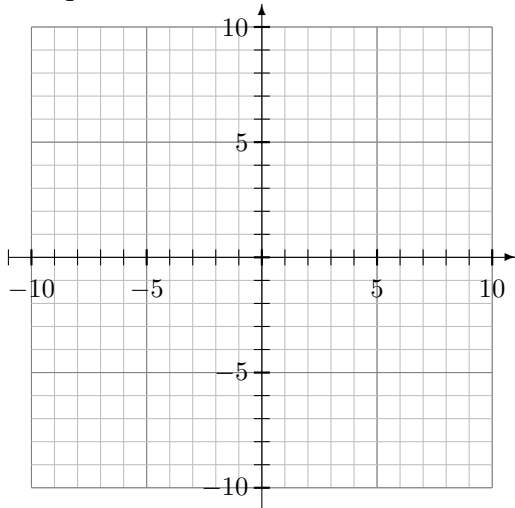


92. Slope: _____, y-intercept: _____
Equation: _____

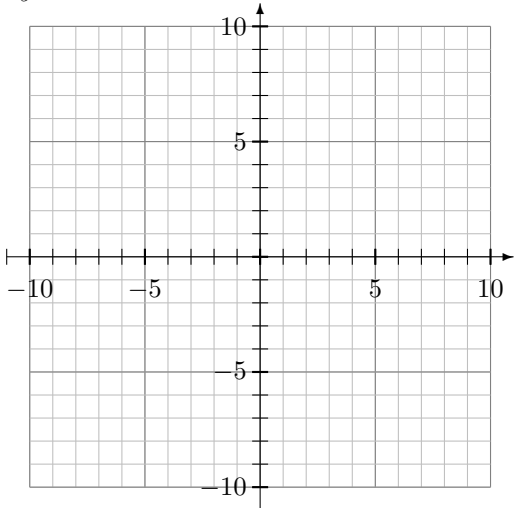


Find the slope and y-intercept and sketch the graph.

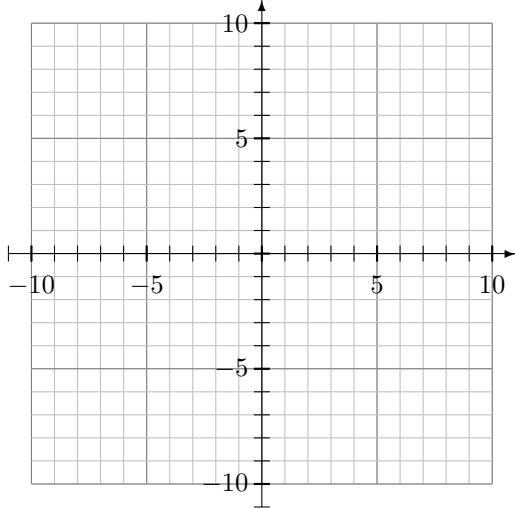
93. $y = \frac{3}{4}x - 2$



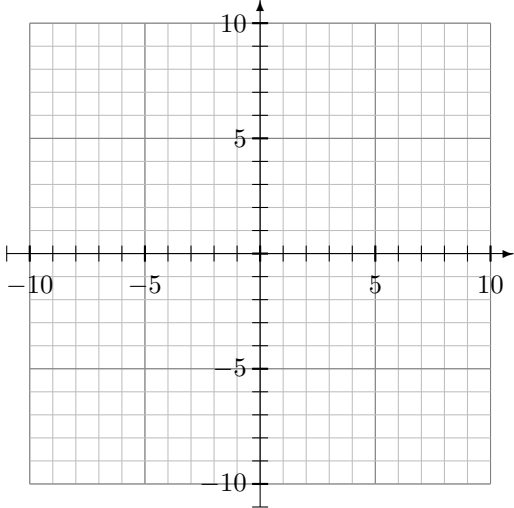
95. $2y = 3x - 12$



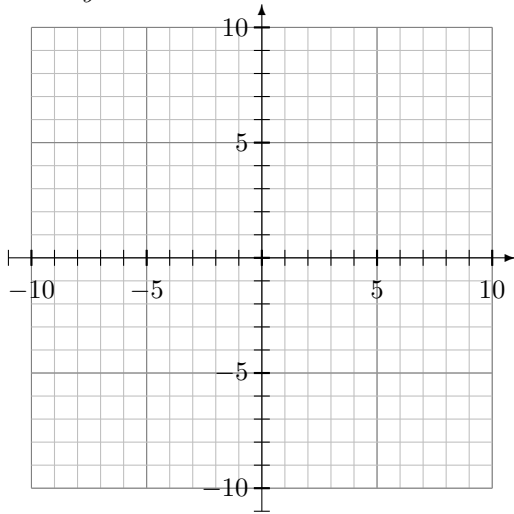
94. $y = -\frac{2}{3}x + 7$



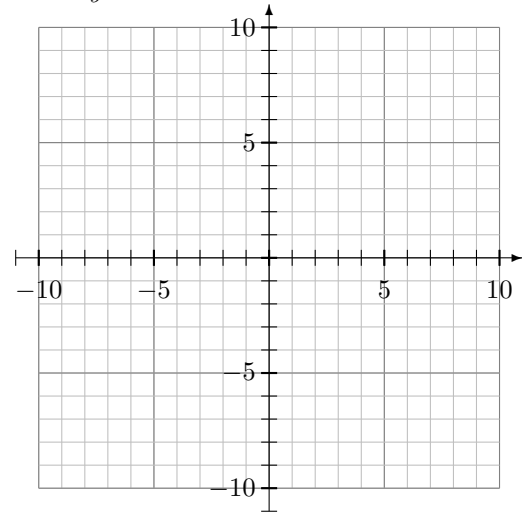
96. $3y = -2x - 9$



97. $7x + 4y = 16$



98. $8x - 3y = -12$



Solve each system of equations.

99. $x + y = 7$
 $x - y = 1$

102. $3x + 2y = 18$
 $2x + 3y = 24$

105. $x = 2y + 1$
 $3x - 4y = 9$

100. $x - y = 8$
 $3x - y = 28$

103. $y = x + 3$
 $2x + 3y = 19$

106. $3x + 5y = 17$
 $2x - 3y + 16 = 2$

101. $3x + 2y = 16$
 $x - 4y = -4$

104. $y = \frac{1}{2}x - 4$
 $3x - 2y = 16$

Determine if the system of equations has one solutions, no solution, or infinitely many solutions

107. $2y - 4x = 6$
 $-2x + y = -4$

108. $3x - 2y = 5$
 $2x + 3y = -18$

109. $y = x + 6$
 $3x - 3y = -18$

Find the greatest common factor for each pair.

110. 12, 18

112. 26, 39

114. $4x^2y, 16x^3y^2$

111. 18, 24

113. 6, 12

115. $8x^2y^3z, 12x^3y^2z^4$

Factor out the greatest common factor

116. $6x^2 + 9xy^2$

118. $9x^3y^2z - 18y^3z^2$

120. $12x^3y^2 - 9x^3y^5 + 9x^2y^3$

117. $4x^2y^3 - 12x^3y^5$

119. $6x^3y^2 - 3x^2y$

Multiply the polynomials

121. $(x + 2)(x + 3)$

122. $(3x - 2)(x - 7)$

123. $(x + 6)(x - 3)$

124. $(2x + 5)(x - 3)$

125. $(2x - 3)(2x + 3)$

126. $(3x + 2)(3x + 2)$

127. $(2x - 5)(x^2 + 1)$

128. $(x + 2)(x^2 + 2x + 3)$

129. $(2x + 1)(x^2 - x - 4)$

Factor each polynomials as completely as possible.

130. $x^2 + 8x + 15$

131. $x^2 - 7x + 12$

132. $x^2 - 6x + 9$

133. $x^2 + 9x + 14$

134. $b^2 - 5b + 4$

135. $x^2 - 36$

136. $x^2 + 49$

137. $x^2 + 12x + 36$

138. $3x^2 - 4x - 15$

139. $x^3 + 2x^2 - 15x$

140. $2x^3 - 8x^2 - 24x$

141. $2x^3y - 18xy - 28y$

142. $x^4 - 16$

143. $64x^2 - 1$

Solve the equations.

144. $x^2 + 6x + 5 = 0$

145. $x^2 + 7x - 18 = 0$

146. $2x^2 - 8x = 0$

147. $12y^2 - 5y = 2$

148. $x^2 = -25 - 10x$

149. $2y^2 + y = -10$

150. $x^2 + 6x + 1 = 0$

151. $x^2 = 10x + 2$

152. $3x^2 - 2x - 10 = 0$

153. $|x + 3| = 12$

154. $|2x - 4| = 20$

155. $6 + |x - 2| = 15$

156. $x^3 = -27$

157. $x^5 = 32$

158. $x^4 = 12$

159. $(x - 3)^2 = 25$

160. $(x + 4)^3 = 8$

161. $\sqrt{x - 2} = 10$

162. $\sqrt{x + 5} - 3 = 4$

163. $\frac{4}{x} - 5 = \frac{3}{x - 3}$

164. $\frac{3}{x + 2} + \frac{5}{x - 1} = 20$

Solve the inequality.

165. $2y < 12$

166. $y + 6 \leq 9$

167. $5y + 2 > 12$

168. $-2x + 3 < 18$

169. $-2x - 7 < 6x + 5$

170. $-12 \leq \frac{x + 7}{3} \leq 4$

171. $13 < 5 - 2x < 43$

172. $|x - 2| < 16$

173. $|3x - 7| \geq 4$

174. $7 + |2x - 5| > 9$

175. $|3x + 2| + 5 < 3$

Find the value of each.

176. $a = bn$ if $b = 4$ and $n = 3$

177. $p = 2l + 2w$ if $l = 3$ and $w = 6$

178. $A = \pi r^2$ if $\pi = 3.14$ and $r = 7$

179. $I = Prt$ if $P = 4000$, $r = 0.06$ and $t = 5$

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

181. $f(-7)$ if $f(x) = -2x^2 + 3x - 5$

182. $f(-2)$ if $f(x) = 3x^3 - 4$

Evaluate and simplify.

183. $f(x - 2)$ if $f(x) = x^2 + 4$

185. $f(x + a)$ if $f(x) = 2x + 3$

184. $f(x - 3)$ if $f(x) = 2x + 7$

186. $f(x + b)$ if $f(x) = x^2 + 2x + 3$

Perform the indicated operations and simplify. Express all answers with positive exponents only.

187. $\frac{x}{3} + \frac{2}{x}$

192. $\frac{2a}{3x} - \frac{3a - 4}{6x}$

198. $\left(\frac{3}{4}\right)^{-3}$

188. $\frac{5}{2x} + \frac{6}{3y}$

193. $(2x^3y^2)^5$

199. $\left(\frac{5a^2b^3c^{-1}}{2a^{-2}b^4}\right)^3$

189. $\frac{3}{x+2} \cdot \frac{4}{x}$

194. $(2x^3y^4)^{-2}$

195. $(3x^{-2}y^5)^2$

200. $\left(\frac{8}{27}\right)^{\frac{2}{3}}$

190. $\frac{2x+4}{3x} \cdot \frac{x}{x+2}$

196. $(3x^2y)^2(2x^3y^2)$

201. $\left(\frac{1}{4}\right)^{-\frac{1}{2}}$

191. $\frac{3a}{2a-12} \div \frac{9}{a-6}$

197. $\left(\frac{3x^2y}{2xy^3}\right)^{-4}$

Find x .

202. $\log_2 8 = x$

204. $\log_x 1000 = 3$

203. $\log_5 x = 4$

205. $\log_5 \frac{1}{5} = x$

Simplify and rationalize the denominator if needed.

206. $\sqrt{25}$

211. $\sqrt{20x^4y^9}$

214. $\sqrt{\frac{32a^5}{25y^3}}$

207. $\sqrt{72}$

212. $\sqrt{\frac{12}{5}}$

215. $\sqrt{2} + 3\sqrt{3} + 4\sqrt{2}$

208. $\sqrt{48}$

209. $\sqrt{49a^2b^4}$

213. $\sqrt{\frac{6a^2}{5b}}$

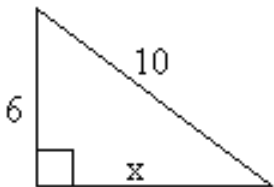
216. $5\sqrt{3} + 3\sqrt{12}$

210. $\sqrt{50a^6b^3}$

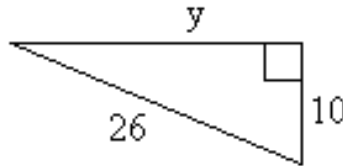
217. $\sqrt{9} - \sqrt{2} + \sqrt{18} + 4$

Find the missing side.

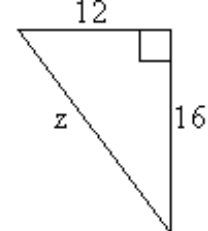
218. $x =$



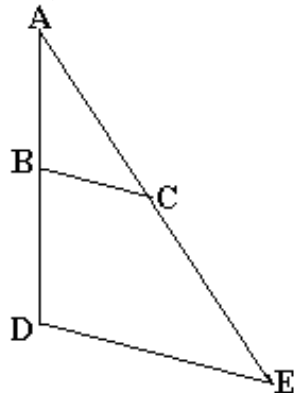
219. $y =$



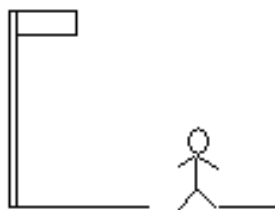
220. $z =$



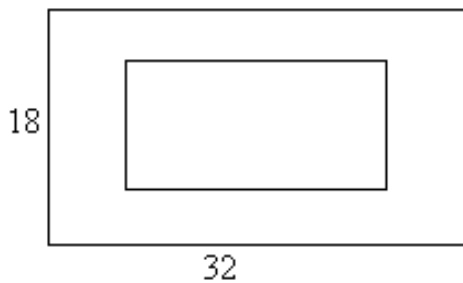
221. Given that $\overline{BC} \parallel \overline{DE}$, $\overline{AB} = 6$, $\overline{BC} = 4$, and $\overline{BD} = 8$, find \overline{DE}



222. If the 6 foot man casts a shadow 4 feet long, and the flag pole casts a shadow 28 feet long, how tall is the pole?



223. If the flower bed inside the sidewalk is 20 feet long and 10 feet wide, what is the area of the sidewalk?



224. What is the area of the triangle inside the square if we know the sides of the square are 16 inches?

