

**Summer Packet: Precalculus****Evaluate each expression. (Order of Operations)**

1)  $4 - (6 - 2 - (6 - 3) + 11) \div 4$

2)  $4 \cdot 4 \cdot 3 \cdot (7 - 1) \div 6 + 6$

3)  $5 + 4(12 \div 3 - 1) + 2^3$

4)  $6 + 4 - (5 + 4 - 4) - 18 \div 6$

5)  $y - (5 - (3 - z - (y - x))) \div 4$ ; use  $x = 2$ ,  $y = 3$ , and  $z = 1$

6)  $q^2 + (r + r)(r - 2 \div 2)$ ; use  $q = 6$ , and  $r = 1$

7)  $r(q + 2)(4 - p \div 3) + p$ ; use  $p = 3$ ,  $q = 5$ , and  $r = 2$

8)  $3(m + p - m - (p - n)) - m$ ; use  $m = 5$ ,  $n = 3$ , and  $p = 5$

**Solve each equation. (Solving Multi-step Equations)**

9)  $3(3 + 5v) = -26 + 8v$

10)  $-12 + x = 6x + 6(-2 - 8x)$

11)  $22 - 2x = -3(x - 6)$

12)  $15 - 5v = 2(-7v + 3)$

13)  $8(8v + 1) = -4(v - 2) + v$

14)  $-(1 + 7m) - 2(m - 6) = -8m - 2m$

15)  $5(3k + 7) + 4(1 - k) = k - 3 + 6k - 6$

16)  $-7(-n - 7) = 7(n + 5) + 1$

**Solve each equation. (Solving Absolute-Value Equations)**

17)  $|x - 3| = 11$

18)  $\left| \frac{r}{3} \right| = 1$

19)  $-10|-6x| = -60$

20)  $\frac{|-3 + x|}{9} = 3$

$$21) |10 + 9b| - 1 = 27$$

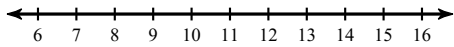
$$22) -6|-10 + 6r| = -96$$

$$23) 9 + 5|10n + 8| = 99$$

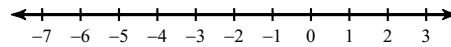
$$24) 9|-3n - 7| + 3 = 66$$

**Solve each inequality and graph its solution. (Solve Multi-step Inequalities)**

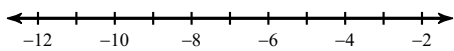
$$25) 106 \leq 1 + 7(a + 7)$$



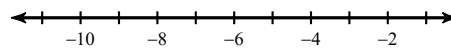
$$26) -7(7m + 2) - 3m < 90$$



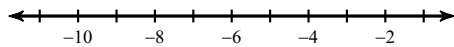
$$27) 98 > -7(1 + 3v)$$



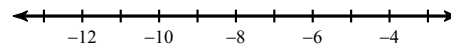
$$28) 8 - 8(m - 8) \leq 136$$



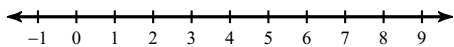
$$29) -3(6 - x) < -30 + x$$



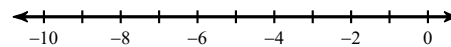
$$30) 5 - 8x > -3(2x - 7)$$



$$31) 8x + 38 < -4(1 - 6x) - 6$$

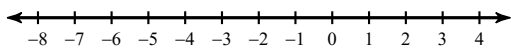


$$32) 6 + 6k < -3(-k + 6)$$

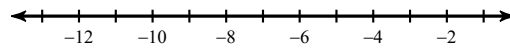


**Solve each compound inequality and graph its solution. (Solving Compound Inequalities)**

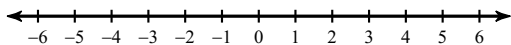
$$33) -4 < x - 2 \leq -1$$



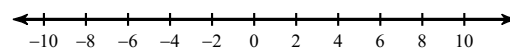
$$34) -6 \leq p + 3 \leq -2$$



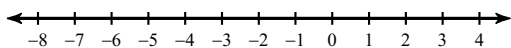
$$35) 2b \geq -4 \text{ and } b + 6 \leq 11$$



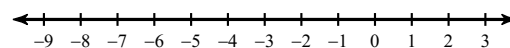
$$36) \frac{x}{7} > 1 \text{ or } -6x > 42$$



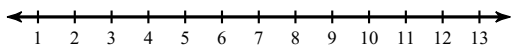
$$37) 4 \leq 4 - 10b \leq 54$$



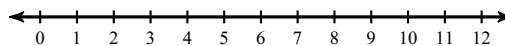
$$38) v + 1 \leq -3 \text{ or } v + 8 \geq 6$$



39)  $8 - 9n > -82$  and  $5n - 6 > 19$

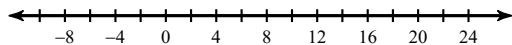


40)  $8 < 5r + 3 < 48$

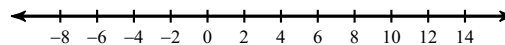


**Solve each inequality and graph its solution. (Solving Absolute Value Inequalities)**

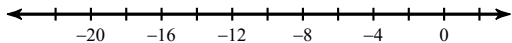
41)  $|n - 7| \geq 14$



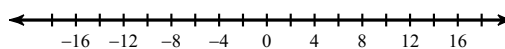
42)  $|k - 4| > 8$



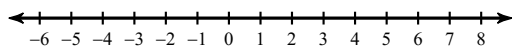
43)  $|10 + x| \leq 10$



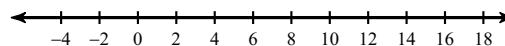
44)  $\left|\frac{x}{8}\right| < 2$



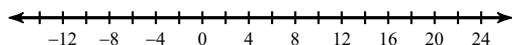
45)  $10|4r| > 120$



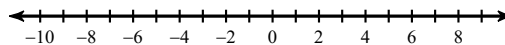
46)  $|x - 7| - 5 \geq 3$



47)  $|-6 + r| + 10 > 25$



48)  $2|6x| \leq 84$



**Each table represents a relation. Determine the domain/range and if the relation is a function. (Functions, Domain & Range)**

49)

$x$	$y$
-6	-1
-3	1
1	-6
2	6
4	-3

50)

$x$	$y$
-7	6
-5	5
-5	-4
-1	-7
6	-5

51)

$x$	$y$
-5	4
-3	-7
5	-5
5	2
6	1

52)

$x$	$y$
-6	3
-6	0
-5	0
0	1
5	-2

**Each set of ordered pairs represents a relation. Determine the domain/range and if the relation is a function.**

53)  $\{(-7, -1), (-7, 6), (1, 6), (1, -4), (2, 2)\}$

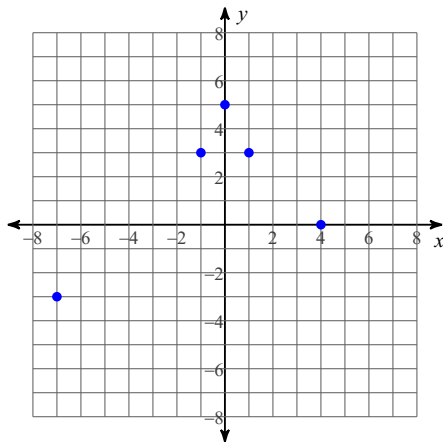
54)  $\{(-5, -3), (4, -7), (4, 6), (6, 6), (7, 1)\}$

55)  $\{(-6, 2), (-5, 3), (1, 4), (3, 3), (7, 2)\}$

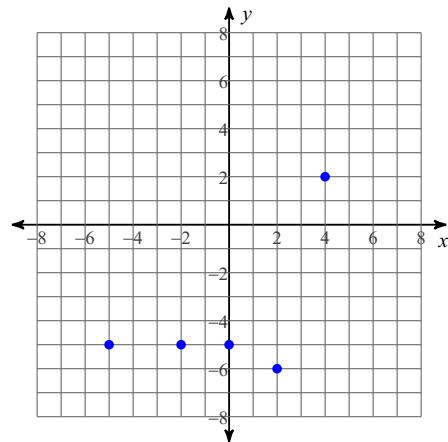
56)  $\{(-4, 2), (-2, 3), (-1, 3), (2, -3), (6, -3)\}$

**Each graph represents a relation. Determine the domain/range and if the relation is a function.**

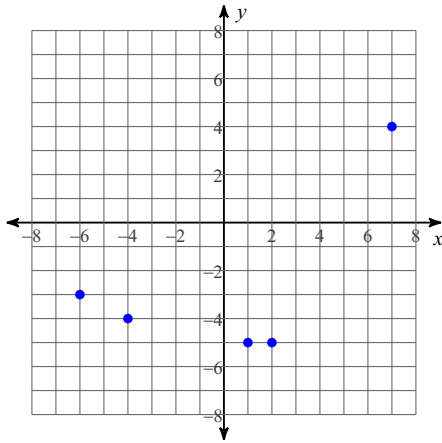
57)



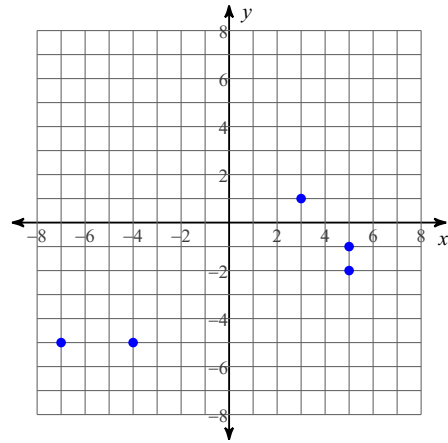
58)



59)

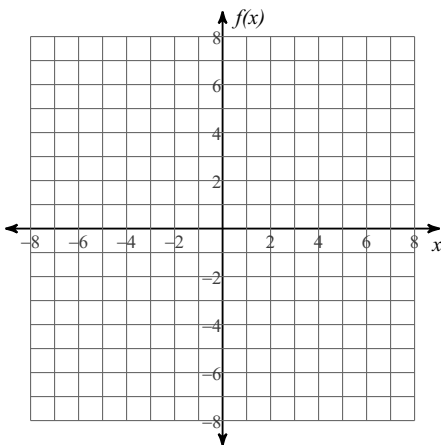


60)

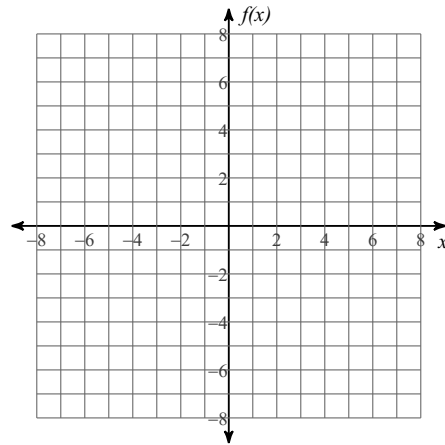


**Evaluate each function for the given value. (Evaluating Functions, Discrete Domain)**

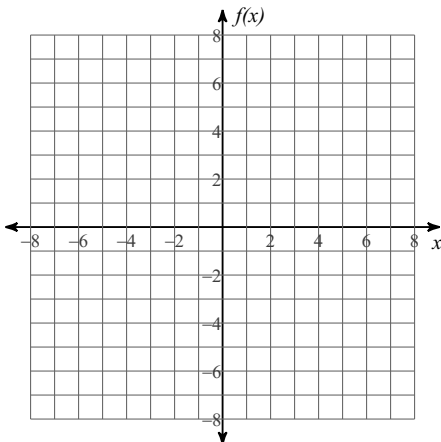
61)  $f(x) = -|x + 2| + 2$   
 Domain:  $\{0, 3, 4, 5, 6\}$



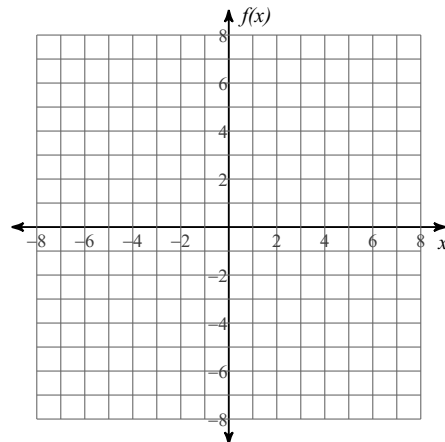
62)  $f(x) = x^2 + 4x - 3$   
 Domain:  $\{-5, -3, -2, -1, 1\}$



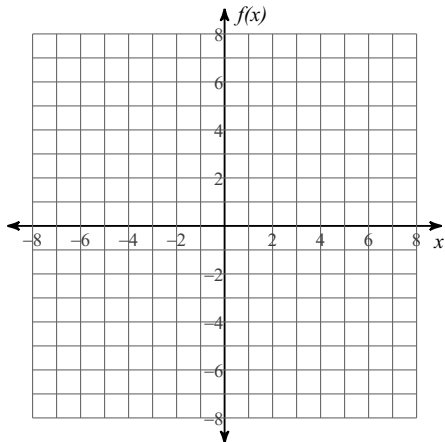
63)  $f(x) = -x^2 + 6x - 3$   
 Domain:  $\{1, 2, 4, 5, 6\}$



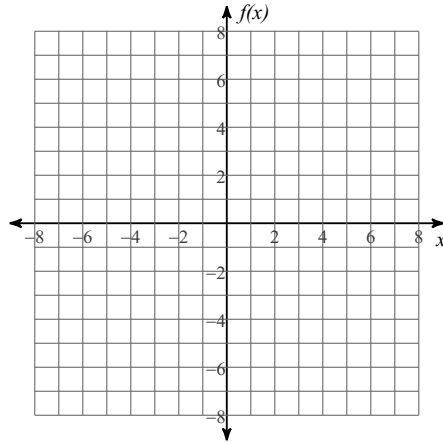
64)  $f(x) = -x^2$   
 Domain:  $\{-2, -1, 0, 1, 2\}$



65)  $f(x) = -2|x + 2| + 5$   
 Domain:  $\{-4, -3, 1, 3, 4\}$



66)  $f(x) = x^2 - 6x + 9$   
 Domain:  $\{1, 2, 3, 4, 5\}$



**Sketch the graph of each line. (Graphing Linear Equations)**

67)  $y = -x + 1$

68)  $y = 0$

69)  $y = -\frac{3}{4}x - 3$

70)  $y = -\frac{3}{5}x + 1$

71)  $8x + 3y = -15$

72)  $2x + 5y = 15$

73)  $4x - y = -1$

74)  $5x - 2y = 10$

75)  $-y + 2 - \frac{1}{4}x = 0$

76)  $y - 5 = -6x$

77)  $-y - 3 = 0$

78)  $-9x = -y - 5$

**Write the slope-intercept form of the equation of each line. (Writing Linear Equations)**

79)  $7x + 6y = 48$

80)  $9x - 7y = -49$

81)  $11x + 5y = 51$

82)  $3x + y = 1$

83)  $y - 2 = -\frac{1}{4}(x - 4)$

84)  $y - 5 = -(x + 5)$

85)  $y + 1 = -(x - 5)$

86)  $y + 2 = -\frac{7}{4}(x - 4)$

**Write the slope-intercept form of the equation of the line through the given point with the given slope.**

87) through:  $(-2, 0)$ , slope =  $\frac{1}{5}$

88) through:  $(4, -1)$ , slope = undefined

89) through:  $(4, 0)$ , slope =  $\frac{1}{4}$

90) through:  $(0, 4)$ , slope = undefined

**Write the slope-intercept form of the equation of the line through the given points.**

91) through:  $(-3, -5)$  and  $(0, 3)$

92) through:  $(0, 2)$  and  $(4, -1)$

93) through:  $(-3, 4)$  and  $(1, -5)$

94) through:  $(0, -5)$  and  $(1, -4)$

**Write the slope-intercept form of the equation of the line described.**

95) through:  $(1, -1)$ , parallel to  $y = x - 1$

96) through:  $(1, 1)$ , parallel to  $y = 2x + 5$

97) through:  $(4, 1)$ , parallel to  $y = -\frac{3}{4}x - 1$

98) through:  $(3, 1)$ , parallel to  $y = -\frac{2}{3}x - 1$

99) through:  $(-1, 2)$ , perp. to  $x = 0$

100) through:  $(1, -4)$ , perp. to  $y = -x + 2$

101) through:  $(-3, 3)$ , perp. to  $y = \frac{3}{4}x + 1$

102) through:  $(3, -4)$ , perp. to  $y = -\frac{2}{5}x - 2$

**Sketch the graph of each linear inequality. (Graphing Linear Inequalities)**

103)  $y \leq 3x$

104)  $y > \frac{3}{4}x + 3$

105)  $y > -4$

106)  $y > x + 3$



$$107) 5x + y > 5$$

$$108) x - 4y \leq 12$$

$$109) 5x + 3y \geq 3$$

$$110) x < -2$$

**Sketch the solution to each system of inequalities. (Systems of Linear Inequalities)**

$$111) \begin{aligned} y &\leq \frac{1}{3}x - 2 \\ y &> -\frac{4}{3}x + 3 \end{aligned}$$

$$112) \begin{aligned} y &\leq \frac{1}{2}x - 3 \\ y &> -\frac{3}{2}x + 1 \end{aligned}$$

$$113) \begin{aligned} y &\leq \frac{1}{3}x - 1 \\ y &> \frac{4}{3}x + 2 \end{aligned}$$

$$114) \begin{aligned} y &\leq 1 \\ y &\geq -2x - 1 \end{aligned}$$

$$115) \begin{cases} y > 2x - 1 \\ y < -3 \end{cases}$$

$$116) \begin{cases} y \geq \frac{1}{3}x + 2 \\ y \leq \frac{5}{3}x - 2 \end{cases}$$

$$117) \begin{cases} y > -1 \\ 2x - y \leq -3 \end{cases}$$

$$118) \begin{cases} 6x + y \leq 3 \\ x + y \geq -2 \end{cases}$$

$$119) \begin{cases} 2x - y > -2 \\ x + 2y < -6 \end{cases}$$

$$120) \begin{cases} y \geq -3 \\ 6x + y \geq 3 \end{cases}$$

$$121) \begin{cases} x + 2y > 2 \\ 2x + y \geq -2 \end{cases}$$

$$122) \begin{cases} 5x - y \geq -3 \\ x - y \leq 1 \end{cases}$$

**Solve each system by elimination. (Solving Systems by Elimination)**

$$123) \begin{cases} -5r + 3s - 5t = 10 \\ 4r - 6s + t = -8 \\ 5r + s - 6t = -10 \end{cases}$$

$$124) \begin{cases} -2r - 5s + t = 7 \\ -6r + 5s + t = -27 \\ 4r + 3s - 4t = 19 \end{cases}$$

$$\begin{aligned} 125) \quad & 2r - 4s + 2t = -20 \\ & -r - 3s - 4t = -9 \\ & -2r - 5s - 3t = -23 \end{aligned}$$

$$\begin{aligned} 126) \quad & 2a + b + c = -5 \\ & 5a - 5b + 3c = 4 \\ & 4b - 3c = -17 \end{aligned}$$

$$\begin{aligned} 127) \quad & -x + 2y - 3z = -5 \\ & 3x + 3y - z = -15 \\ & -2x - 4y + 3z = 17 \end{aligned}$$

$$\begin{aligned} 128) \quad & 5r - 6s - 3t = -3 \\ & 3r + 3s - t = -25 \\ & r + 2s + t = -7 \end{aligned}$$

$$\begin{aligned} 129) \quad & 5x + 3y + 2z = -26 \\ & -3x + 4y - 6z = 3 \\ & 6x - y + 4z = -19 \end{aligned}$$

$$\begin{aligned} 130) \quad & -6x + 6y - 2z = 14 \\ & -5x + 3y + 3z = -9 \\ & -4x + 3y + z = -1 \end{aligned}$$

$$\begin{aligned} 131) \quad & 4x - y + 3z = 18 \\ & 3x - y + z = 14 \\ & 5x + 5y - 6z = 10 \end{aligned}$$

$$\begin{aligned} 132) \quad & -a - 6b - 4c = 23 \\ & 4a - b + 3c = 6 \\ & -2a + 4b + 3c = -6 \end{aligned}$$

$$\begin{aligned} 133) \quad & 5x - 3y - 3z = -19 \\ & 5x - 2y - 4z = -11 \\ & x - 2y - z = -6 \end{aligned}$$

$$\begin{aligned} 134) \quad & 6x + 6y + 3z = -15 \\ & 4x - 2y + 4z = -30 \\ & 4x + y + 3z = -20 \end{aligned}$$

**Sketch the graph of each function. (Graphing Quadratic Functions)**

$$135) \quad y = 2x^2$$

$$136) \quad y = x^2$$

$$137) \quad y = -3x^2$$

$$138) \quad y = -2x^2$$

$$139) y = x^2$$

$$140) y = 2x^2$$

$$141) y = \frac{1}{2}x^2$$

$$142) y = -x^2$$

$$143) y = 2(x - 1)^2 - 2$$

$$144) y = -(x + 4)^2 + 4$$

$$145) y = (x - 4)^2 + 1$$

$$146) y = (x + 4)^2 - 1$$

$$147) y = 2(x + 4)^2 + 4$$

$$148) y = 2(x + 4)^2 - 4$$

149)  $y = 2(x - 1)^2 + 4$

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

**Factor each completely. (Factoring Quadratic Expressions)**

151)  $x^2 + 8x - 9$

152)  $n^2 + 3n - 18$

153)  $n^2 + 16n + 60$

154)  $m^2 + 7m + 6$

155)  $k^2 - 12k + 20$

156)  $k^2 + 6k - 16$

157)  $a^2 + a - 90$

158)  $b^2 - 10b$

159)  $2b^2 + 10b - 100$

160)  $2x^2 - 128$

161)  $6r^2 - 72r + 210$

162)  $5v^2 - 30v + 25$

163)  $6p^2 - 18p - 240$

164)  $3a^2 - 30a + 72$

165)  $6x^2 - 48x$

166)  $3a^2 + 48a + 189$

167)  $5v^2 + 42v - 27$

168)  $3r^2 - 31r + 56$

169)  $3k^2 - 14k + 15$

170)  $7n^2 - 37n - 30$

171)  $2b^2 + 11b + 9$

172)  $3x^2 + 5x - 2$

173)  $3k^2 + 8k$

174)  $5m^2 + 29m - 42$

175)  $18b^2 + 174b + 108$

176)  $21x^2 + 96x - 180$

177)  $18n^2 - 222n + 420$

178)  $4n^2 + 50n + 126$

179)  $15n^2 + 100n - 35$

180)  $28r^2 - 68r + 40$

181)  $10r^2 + 64r - 42$

182)  $28x^2 - 264x + 320$

183)  $9n^2 - 30n + 16$

184)  $9r^2 + 48r + 64$

185)  $6n^2 - n - 12$

186)  $4r^2 + 12r$

187)  $9b^2 - 42b + 40$

188)  $9n^2 - 91n + 90$

189)  $9x^2 + 27x$

190)  $10v^2 - 33v - 54$

191)  $27n^2 - 276n + 60$

192)  $50x^2 + 215x - 45$

193)  $45x^2 + 225x + 250$

194)  $18p^2 - 142p - 180$

195)  $12x^2 + 32x$

196)  $48k^2 - 270k - 108$

197)  $18r^2 - 60r + 32$

198)  $36b^2 - 72b - 160$

199)  $16m^2 - 40m + 25$

200)  $9x^2 - 30x + 25$

201)  $9n^2 - 4$

202)  $25n^2 + 20n + 4$

203)  $9n^2 - 1$

204)  $4n^2 + 20n + 25$

205)  $4b^2 - 25$

206)  $9x^2 + 6x + 1$

207)  $75x^2 - 48$

208)  $16a^2 - 80a + 100$

209)  $125p^2 - 45$

210)  $45n^2 - 30n + 5$

211)  $32n^2 - 18$

212)  $45n^2 + 150n + 125$

213)  $50n^2 - 8$

214)  $36x^2 - 4$

**Find the value of c that completes the square. (Completing the Square)**

215)  $x^2 - 14x + c$

216)  $x^2 - 5x + c$

217)  $x^2 + 18x + c$

218)  $x^2 + 8x + c$

219)  $x^2 + 11x + c$

220)  $y^2 - 36y + c$

221)  $x^2 - 42x + c$

222)  $p^2 - 16p + c$

**Solve each equation by completing the square. (Solving Quadratic Equations by Completing the Square)**

223)  $a^2 + 16a - 48 = 9$

224)  $v^2 + 20v + 16 = -3$

225)  $x^2 - 20x + 89 = -7$

226)  $v^2 - 20v + 82 = -2$

227)  $x^2 + 2x - 91 = -10$

228)  $x^2 + 16x + 41 = 2$

229)  $v^2 - 32 = 14v$

230)  $n^2 + 4n = -3$

231)  $a^2 - 3 = -2a$

232)  $n^2 - 16n = -57$

233)  $m^2 - 24 = 2m$

234)  $r^2 = 49 + 8r$

235)  $5v^2 - 20v + 7 = -8$

236)  $7m^2 - 14m - 68 = -4$

237)  $4r^2 + 16r - 58 = -10$

238)  $2r^2 - 12r + 3 = -7$

239)  $10n^2 - 20n - 24 = 6$

240)  $7p^2 + 14p - 2 = -3$

241)  $7v^2 - 19v - 24 = -8$

242)  $5a^2 + 16a - 3 = -6$

243)  $5r^2 - 18r + 8 = -8$

244)  $8m^2 + 13m - 2 = -3$

245)  $2n^2 + 5n - 1 = -4$

246)  $5n^2 - 8n + 7 = 4$

**Solve each equation by factoring. (Solving Quadratic Equations by Factoring)**

247)  $k^2 + 14k + 48 = 0$

248)  $p^2 - 6p - 7 = 0$

249)  $x^2 - 7x + 6 = 0$

250)  $n^2 + 5n + 4 = 0$

251)  $x^2 + 4x = 0$

252)  $p^2 + 7p + 12 = 0$

253)  $6n^2 - 72n + 210 = 0$

254)  $6x^2 + 30x = 0$

255)  $3p^2 - 24p = 0$

256)  $7x^2 + 56x + 112 = 0$

257)  $6r^2 - 24r + 24 = 0$

258)  $7p^2 + 98p + 336 = 0$

259)  $5x^2 - 5x - 275 = 5$

260)  $5r^2 + 15r - 147 = -7$

261)  $2x^2 - 30x + 119 = 7$

262)  $4n^2 - 20n - 49 = 7$

263)  $8v^2 - 32v - 34 = 6$

264)  $6v^2 - 30v - 29 = 7$

265)  $a^2 - 1 = 3$

266)  $r^2 - 12r + 40 = 4$

267)  $n^2 - 2n - 5 = -5$

268)  $x^2 + 7x + 3 = 3$



269)  $a^2 - 3a - 17 = -7$

270)  $n^2 + 2n - 39 = -4$

271)  $2x^2 + x = 28$

272)  $7k^2 = 25k - 12$

273)  $3b^2 = -20b - 25$

274)  $7v^2 - 27v = -18$

275)  $10p^2 + 39p = -14$

276)  $5b^2 + 12 = -16b$

277)  $12x^2 - 36 = -6x$

278)  $35v^2 - 210 = 215v$

279)  $21x^2 + 56 = -175x$

280)  $28p^2 = 164p + 24$

281)  $105r^2 + 42 = 133r$

282)  $9a^2 = 51a + 18$

**Simplify each expression. (Adding/Subtracting Polynomials)**

283)  $(v^3 - 3v^4 - 4v) + (5v^3 + 8v - 2v^4)$

284)  $(b^3 - b - 4b^2) - (5b + 7b^3 - 5b^2)$

285)  $(5 + 4v + 7v^2) + (v^4 + 8 - 5v)$

286)  $(7k^2 + 4k + 5) - (5k + 7 - k^3)$

287)  $(8v + 2v^4 - v^3) - (v - 7v^3 - 5v^4)$

288)  $(5x^3 - 2x^2 + 4x) - (5x^2 - 7 + 7x)$

289)  $(7x^3 - 5x^4 - 6) + (x^3 + 7x^4 + 1) + (3x^4 + 4)$

290)  $(1 - 7r - 6r^4) + (7 - 2r + 2r^4) + (8 - 6r)$

291)  $(8m - 7m^3 - 2m^4) + (6m^3 - m - 4m^4) + (8m - m^4)$

292)  $(1 - 4p^3 - 6p^4) - (2p - 3p^3 + 8p^2) - (p^4 + 2p^3)$

293)  $(6x^3 - 3x + 7x^2) + (6x + 3 + 2x^2) + (3 + 2x^3)$

$$294) (4r^2 - 7r - 7) + (6r^3 - 5r^2 - 1) + (7 - 7r)$$

**Find each product. (Multiplying Polynomials)**

$$295) 3(3n + 1)$$

$$296) 2(3r + 3)$$

$$297) 2(n - 1)$$

$$298) 3x(2x - 2)$$

$$299) (3n - 1)(2n - 1)$$

$$300) (3k + 3)(3k - 1)$$

$$301) (x - 1)(3x + 2)$$

$$302) (x + 2)(x - 2)$$

$$303) (2a^2 + a + 2)(a - 3)$$

$$304) (x^2 - x + 2)(x + 1)$$

$$305) (3m^2 - 3m + 1)(3m + 1)$$

$$306) (2p^2 + 3p - 1)(p - 2)$$

$$307) (3p^2 - 2p - 3)(p^2 - 3p + 3)$$

$$308) (3k^2 - 2k - 3)(3k^2 - 2k - 3)$$

$$309) (v^2 - 3v + 3)(v^2 - 2v - 2)$$

$$310) (x^2 - 2x - 1)(2x^2 + 2x + 3)$$

**Factor each completely. (Factor by Grouping)**

$$311) 21p^3 + 49p^2 - 12p - 28$$

$$312) 12p^3 - 32p^2 + 15p - 40$$

$$313) 42n^3 - 49n^2 + 48n - 56$$

$$314) 9x^3 + 24x^2 + 24x + 64$$

$$315) 9m^3 - 24m^2 - 15m + 40$$

$$316) 6x^3 + 5x^2 + 6x + 5$$

$$317) 3n^3 + 3n^2 - 18n - 18$$

$$318) 20x^3 - 80x^2 + 12x - 48$$

$$319) 45r^3 - 15r^2 - 60r + 20$$

$$320) 240x^3 + 96x^2 - 280x - 112$$

321)  $144a^3 + 126a^2 - 336a - 294$

322)  $60n^3 - 100n^2 + 75n - 125$

**Factor each completely. (Factoring sum/difference of Cubes)**

323)  $216x^3 + 1$

324)  $8x^3 + 125$

325)  $8x^3 + 1$

326)  $64x^3 + 27$

327)  $27 + 64m^3$

328)  $1 + 64a^3$

329)  $125x^3 + 1$

330)  $1 + 27x^3$

331)  $216x^3 - 125$

332)  $64 - 27x^3$

333)  $125x^3 - 216$

334)  $27x^3 - 64$

335)  $m^3 - 1$

336)  $8u^3 - 125$

337)  $125x^3 - 64$

338)  $8x^3 - 27$

339)  $128x^3 - 2$

340)  $-2x^3 + 432$

341)  $375m^3 + 648$

342)  $108x^3 + 32$

$$343) 3u^3 + 648$$

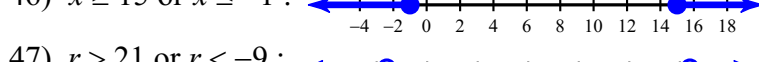
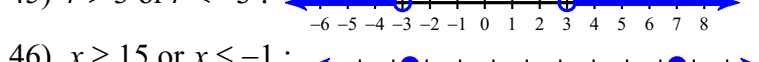
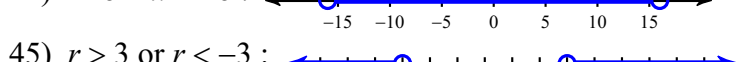
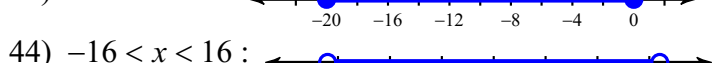
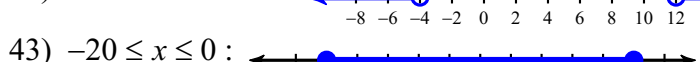
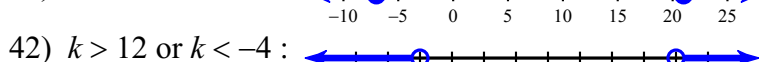
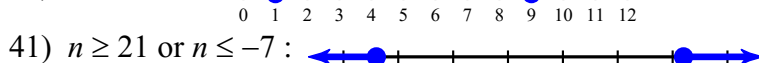
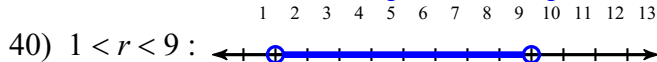
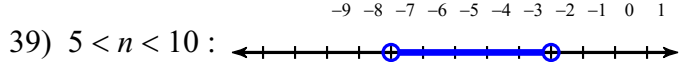
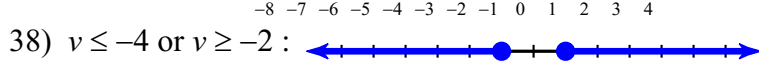
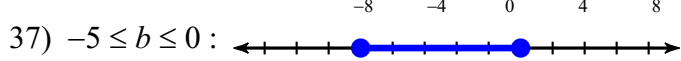
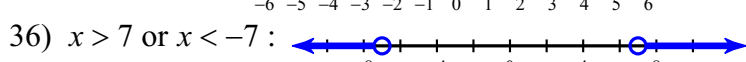
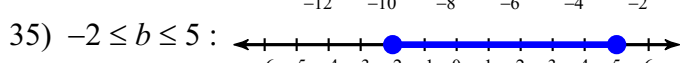
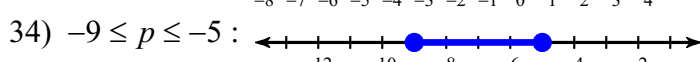
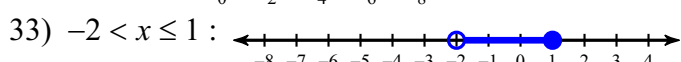
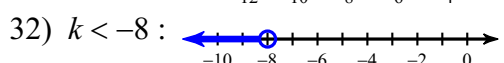
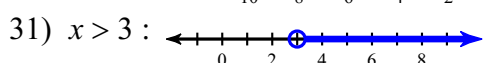
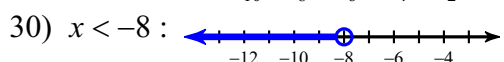
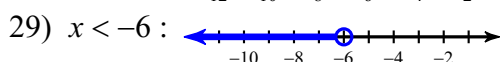
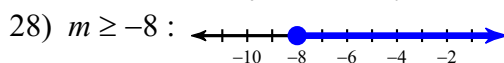
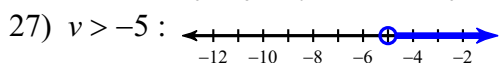
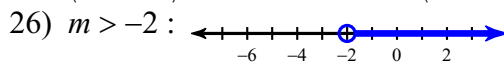
$$344) 16a^3 + 2$$

$$345) -864 - 500x^3$$

$$346) 256x^3 + 500$$

## Answers to Summer Packet: Precalculus (ID: 1)

- |                                       |                                       |                                       |                                       |
|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| 1) 1                                  | 2) 54                                 | 3) 25                                 | 4) 2                                  |
| 5) 2                                  | 6) 36                                 | 7) 45                                 | 8) 4                                  |
| 9) $\{-5\}$                           | 10) $\{0\}$                           | 11) $\{-4\}$                          | 12) $\{-1\}$                          |
| 13) $\{0\}$                           | 14) $\{-11\}$                         | 15) $\{-12\}$                         | 16) No solution.                      |
| 17) $\{14, -8\}$                      | 18) $\{3, -3\}$                       | 19) $\{-1, 1\}$                       | 20) $\{30, -24\}$                     |
| 21) $\left\{2, -\frac{38}{9}\right\}$ | 22) $\left\{\frac{13}{3}, -1\right\}$ | 23) $\left\{1, -\frac{13}{5}\right\}$ | 24) $\left\{-\frac{14}{3}, 0\right\}$ |



49) Domain:  $\{-6, -3, 1, 2, 4\}$

Range:  $\{-6, -3, -1, 1, 6\}$

The relation is a function.

50) Domain:  $\{-7, -5, -1, 6\}$

Range:  $\{-7, -5, -4, 5, 6\}$

The relation is not a function.

51) Domain:  $\{-5, -3, 5, 6\}$

Range:  $\{-7, -5, 1, 2, 4\}$

The relation is not a function.

52) Domain:  $\{-6, -5, 0, 5\}$

Range:  $\{-2, 0, 1, 3\}$

The relation is not a function.

53) Domain:  $\{-7, 1, 2\}$

Range:  $\{-4, -1, 2, 6\}$

The relation is not a function.

54) Domain:  $\{-5, 4, 6, 7\}$

Range:  $\{-7, -3, 1, 6\}$

The relation is not a function.

55) Domain:  $\{-6, -5, 1, 3, 7\}$   
 Range:  $\{2, 3, 4\}$   
 The relation is a function.

58) Domain:  $\{-5, -2, 0, 2, 4\}$   
 Range:  $\{-6, -5, 2\}$   
 The relation is a function.

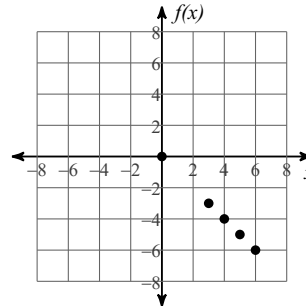
60) Domain:  $\{-7, -4, 3, 5\}$   
 Range:  $\{-5, -2, -1, 1\}$   
 The relation is not a function.

56) Domain:  $\{-4, -2, -1, 2, 6\}$   
 Range:  $\{-3, 2, 3\}$   
 The relation is a function.

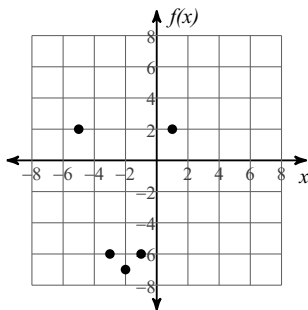
59) Domain:  $\{-6, -4, 1, 2, 7\}$   
 Range:  $\{-5, -4, -3, 4\}$   
 The relation is a function.

57) Domain:  $\{-7, -1, 0, 1, 4\}$   
 Range:  $\{-3, 0, 3, 5\}$   
 The relation is a function.

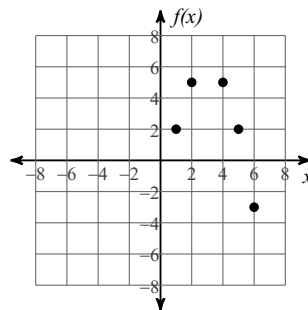
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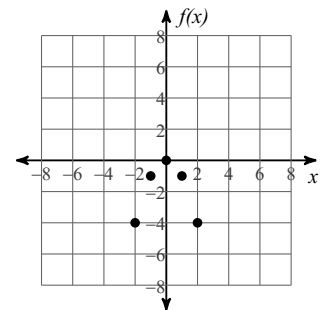
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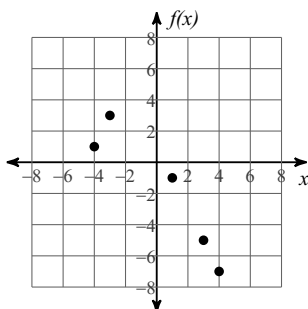
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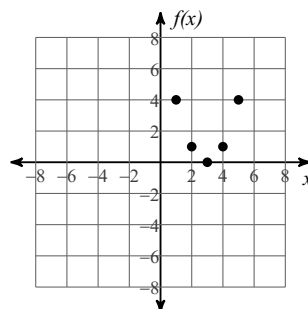
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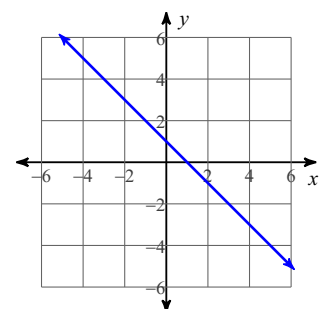
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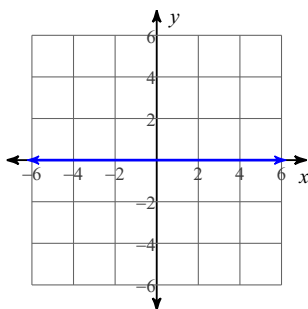
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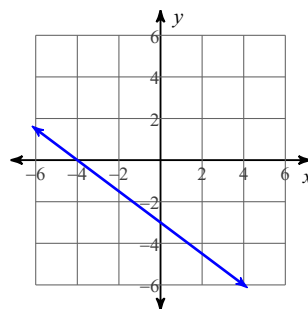
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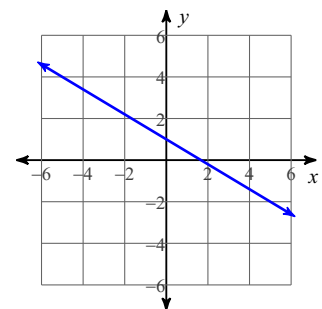
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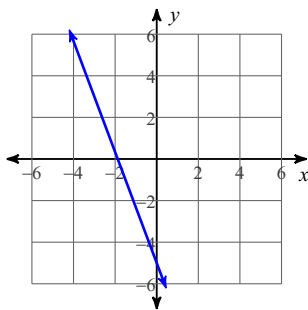
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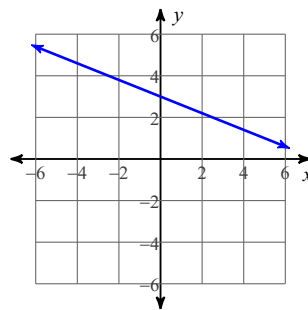
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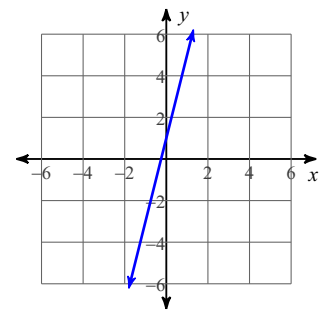
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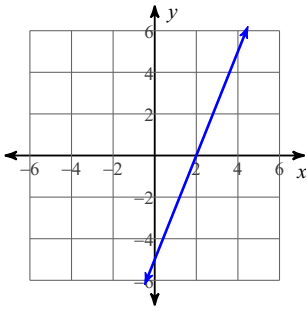
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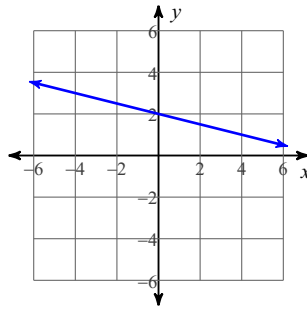
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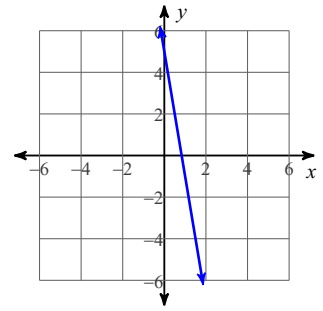
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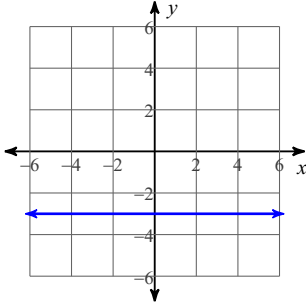
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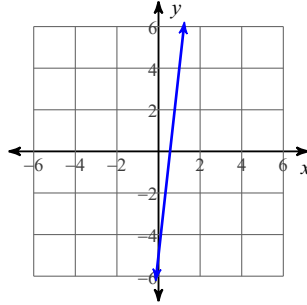
76)



77)



78)



79)  $y = -\frac{7}{6}x + 8$

80)  $y = \frac{9}{7}x + 7$

81)  $y = -\frac{11}{5}x + \frac{51}{5}$

82)  $y = -3x + 1$

83)  $y = -\frac{1}{4}x + 3$

84)  $y = -x$

85)  $y = -x + 4$

86)  $y = -\frac{7}{4}x + 5$

87)  $y = \frac{1}{5}x + \frac{2}{5}$

88)  $x = 4$

89)  $y = \frac{1}{4}x - 1$

90)  $x = 0$

91)  $y = \frac{8}{3}x + 3$

92)  $y = -\frac{3}{4}x + 2$

93)  $y = -\frac{9}{4}x - \frac{11}{4}$

94)  $y = x - 5$

95)  $y = x - 2$

96)  $y = 2x - 1$

97)  $y = -\frac{3}{4}x + 4$

98)  $y = -\frac{2}{3}x + 3$

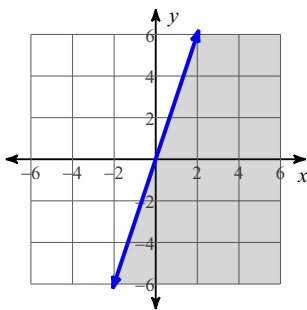
99)  $y = 2$

100)  $y = x - 5$

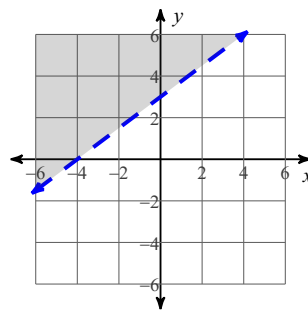
101)  $y = -\frac{4}{3}x - 1$

102)  $y = \frac{5}{2}x - \frac{23}{2}$

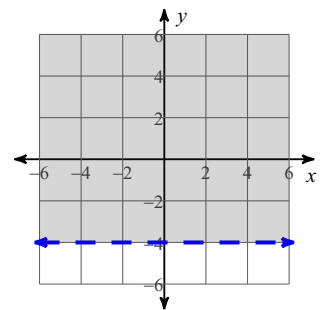
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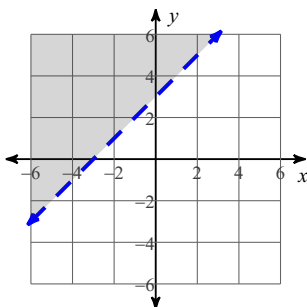
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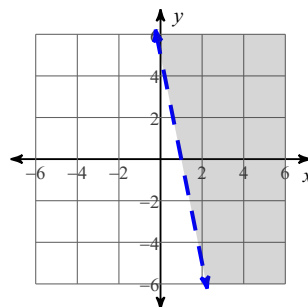
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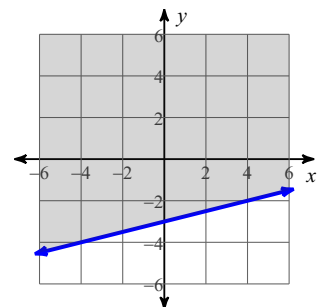
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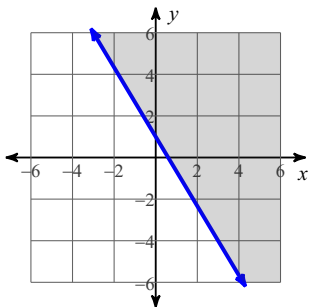
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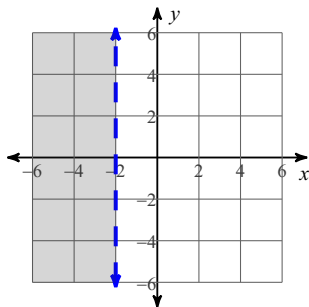
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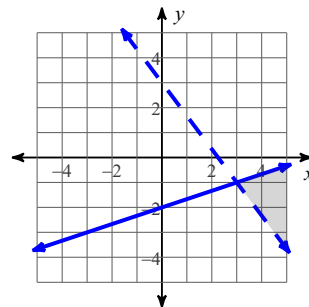
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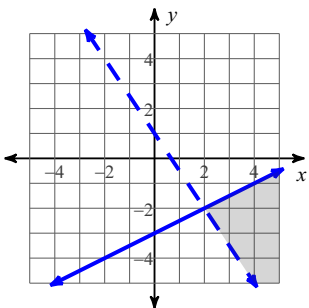
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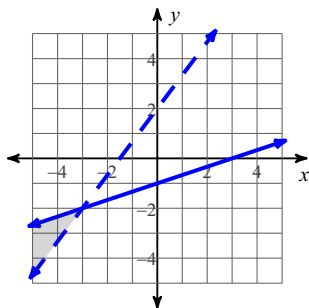
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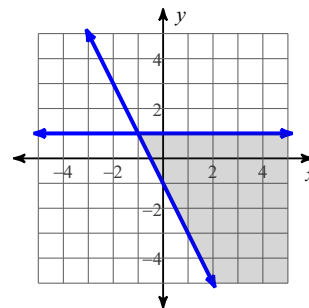
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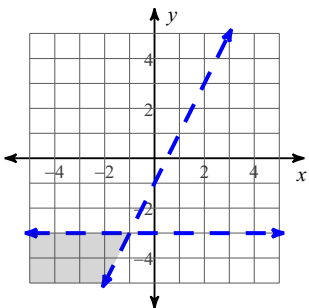
113)



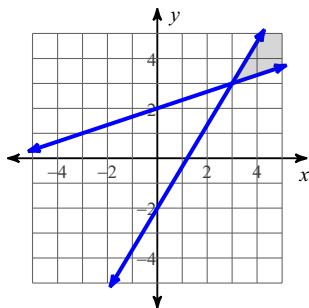
114)



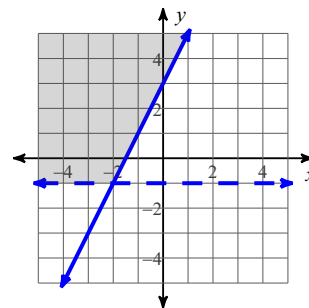
115)



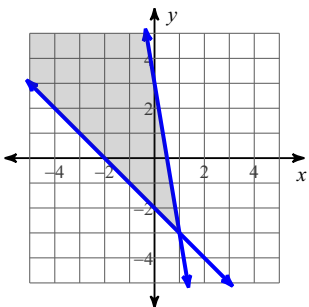
116)



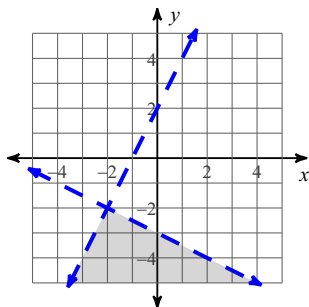
117)



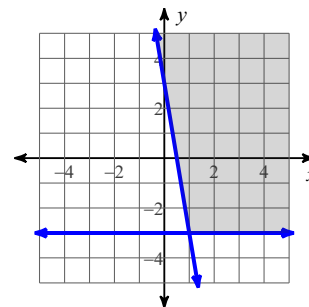
118)



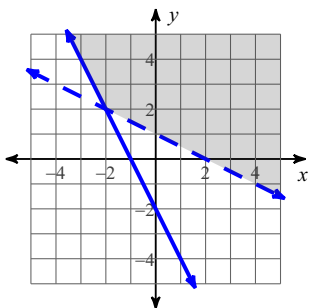
119)



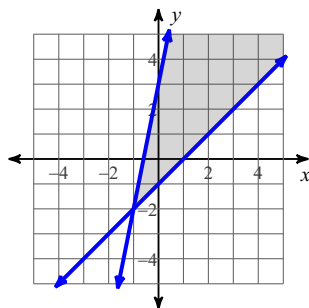
120)



121)



122)



123)  $(-2, 0, 0)$

124)

$(1, -3, -6)$

125)

$(2, 5, -2)$

126)

$(-3, -2, 3)$

127)

$(-4, 0, 3)$

128)

$(-3, -4, 4)$

129)

$(-3, -3, -1)$

130)

Infinitely many solutions

131)

$(4, -2, 0)$

132)

$(-3, -6, 4)$

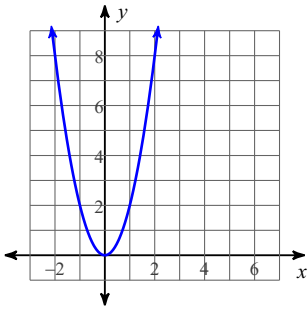
133)

$(-5, 3, -5)$

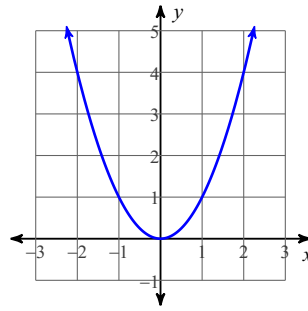
134) Infinitely many solutions



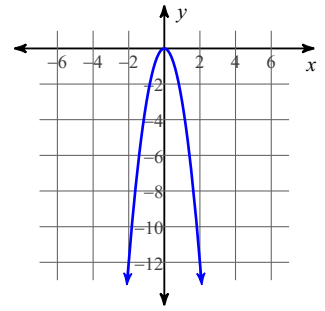
135)



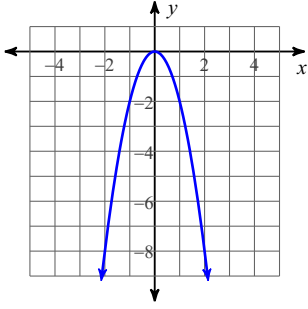
136)



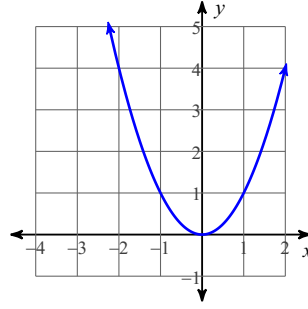
137)



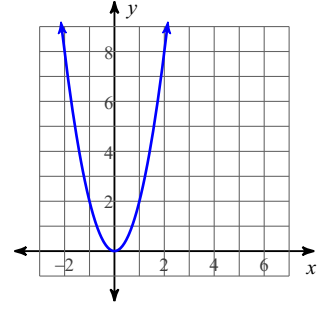
138)



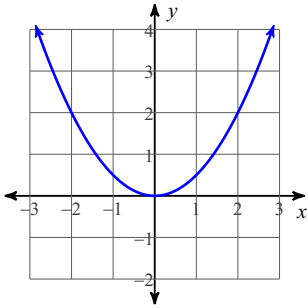
139)



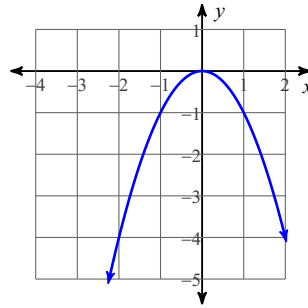
140)



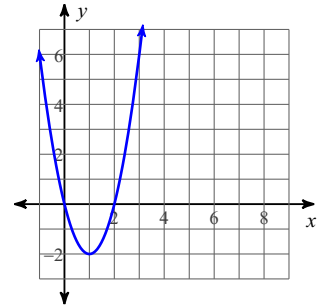
141)



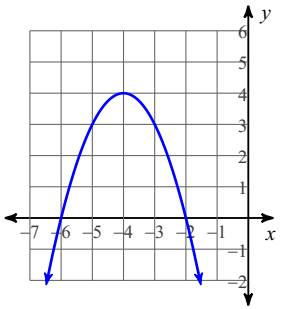
142)



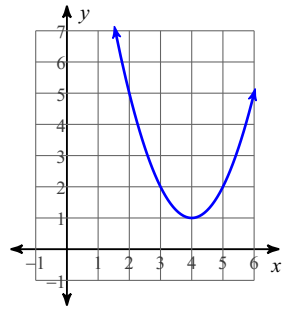
143)



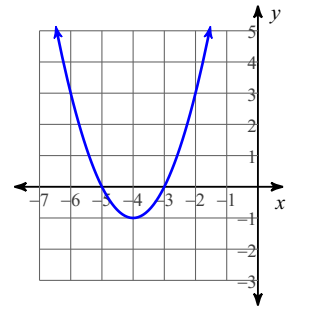
144)



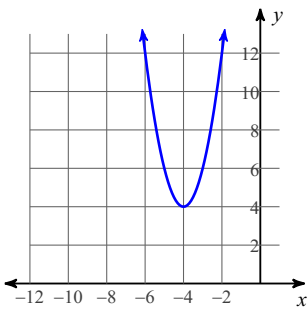
145)



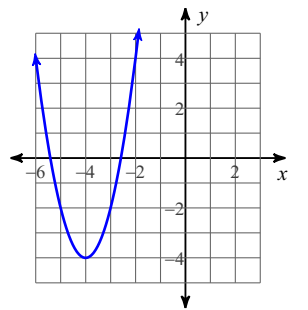
146)



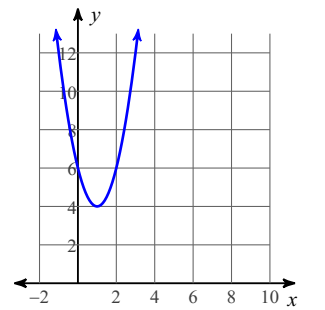
147)



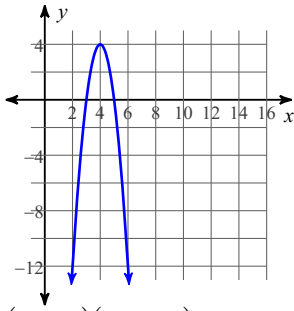
148)



149)



150)

151)  $(x - 1)(x + 9)$ 152)  $(n - 3)(n + 6)$ 

153)  $(n + 6)(n + 10)$

154)  $(m + 6)(m + 1)$

155)  $(k - 10)(k - 2)$

156)  $(k - 2)(k + 8)$

157)  $(a - 9)(a + 10)$

158)  $b(b - 10)$

159)  $2(b - 5)(b + 10)$

160)  $2(x - 8)(x + 8)$

161)  $6(r - 5)(r - 7)$

162)  $5(v - 1)(v - 5)$

163)  $6(p + 5)(p - 8)$

164)  $3(a - 6)(a - 4)$

165)  $6x(x - 8)$

166)  $3(a + 7)(a + 9)$

167)  $(5v - 3)(v + 9)$

168)  $(3r - 7)(r - 8)$

169)  $(3k - 5)(k - 3)$

170)  $(7n + 5)(n - 6)$

171)  $(2b + 9)(b + 1)$

172)  $(3x - 1)(x + 2)$

173)  $k(3k + 8)$

174)  $(5m - 6)(m + 7)$

175)  $6(3b + 2)(b + 9)$

176)  $3(7x - 10)(x + 6)$

177)  $6(3n - 7)(n - 10)$

178)  $2(2n + 7)(n + 9)$

179)  $5(3n - 1)(n + 7)$

180)  $4(7r - 10)(r - 1)$

181)  $2(5r - 3)(r + 7)$

182)  $4(7x - 10)(x - 8)$

183)  $(3n - 2)(3n - 8)$

184)  $(3r + 8)^2$

185)  $(2n - 3)(3n + 4)$

186)  $4r(r + 3)$

187)  $(3b - 10)(3b - 4)$

188)  $(n - 9)(9n - 10)$

189)  $9x(x + 3)$

190)  $(5v + 6)(2v - 9)$

191)  $3(n - 10)(9n - 2)$

192)  $5(2x + 9)(5x - 1)$

193)  $5(3x + 5)(3x + 10)$

194)  $2(p - 9)(9p + 10)$

195)  $4x(3x + 8)$

196)  $6(k - 6)(8k + 3)$

197)  $2(3r - 8)(3r - 2)$

198)  $4(3b - 10)(3b + 4)$

199)  $(4m - 5)^2$

200)  $(3x - 5)^2$

201)  $(3n + 2)(3n - 2)$

202)  $(5n + 2)^2$

203)  $(3n + 1)(3n - 1)$

204)  $(2n + 5)^2$

205)  $(2b + 5)(2b - 5)$

206)  $(3x + 1)^2$

207)  $3(5x + 4)(5x - 4)$

208)  $4(2a - 5)^2$

209)  $5(5p + 3)(5p - 3)$

210)  $5(3n - 1)^2$

211)  $2(4n + 3)(4n - 3)$

212)  $5(3n + 5)^2$

213)  $2(5n + 2)(5n - 2)$

214)  $4(3x + 1)(3x - 1)$

215) 49

216)  $\frac{25}{4}$

217) 81

218) 16

219)  $\frac{121}{4}$

220) 324

221) 441

222) 64

223)  $\{3, -19\}$

224)  $\{-1, -19\}$

225)  $\{12, 8\}$

226)  $\{14, 6\}$

227)  $\{-1 + \sqrt{82}, -1 - \sqrt{82}\}$

228)  $\{-3, -13\}$

229)  $\{16, -2\}$

230)  $\{-1, -3\}$

231)  $\{1, -3\}$

232)  $\{8 + \sqrt{7}, 8 - \sqrt{7}\}$

233)  $\{6, -4\}$

234)  $\{4 + \sqrt{65}, 4 - \sqrt{65}\}$

235)  $\{3, 1\}$

236)  $\left\{\frac{7 + \sqrt{497}}{7}, \frac{7 - \sqrt{497}}{7}\right\}$

237)  $\{2, -6\}$

238)  $\{5, 1\}$

239)  $\{3, -1\}$

240)  $\left\{\frac{-7 + \sqrt{42}}{7}, \frac{-7 - \sqrt{42}}{7}\right\}$

241)  $\left\{\frac{19 + \sqrt{809}}{14}, \frac{19 - \sqrt{809}}{14}\right\}$

242)  $\left\{-\frac{1}{5}, -3\right\}$

243)  $\left\{2, \frac{8}{5}\right\}$

244)  $\left\{\frac{-13 + \sqrt{137}}{16}, \frac{-13 - \sqrt{137}}{16}\right\}$

245)  $\left\{-1, -\frac{3}{2}\right\}$

246)  $\left\{1, \frac{3}{5}\right\}$

247)  $\{-6, -8\}$

248)  $\{7, -1\}$

249)  $\{6, 1\}$

250)  $\{-4, -1\}$

251)  $\{-4, 0\}$

252)  $\{-3, -4\}$

253)  $\{7, 5\}$

254)  $\{-5, 0\}$

255)  $\{8, 0\}$

256)  $\{-4\}$

257)  $\{2\}$

258)  $\{-6, -8\}$

259)  $\{8, -7\}$

260)  $\{4, -7\}$

261)  $\{7, 8\}$

262)  $\{-2, 7\}$

263)  $\{5, -1\}$

264)  $\{6, -1\}$

265)  $\{-2, 2\}$

266)  $\{6\}$

267)  $\{2, 0\}$

268)  $\{-7, 0\}$

269)  $\{-2, 5\}$

270)  $\{-7, 5\}$

- 271)  $\left\{\frac{7}{2}, -4\right\}$       272)  $\left\{\frac{4}{7}, 3\right\}$       273)  $\left\{-\frac{5}{3}, -5\right\}$       274)  $\left\{\frac{6}{7}, 3\right\}$
- 275)  $\left\{-\frac{7}{2}, -\frac{2}{5}\right\}$       276)  $\left\{-\frac{6}{5}, -2\right\}$       277)  $\left\{\frac{3}{2}, -2\right\}$       278)  $\left\{-\frac{6}{7}, 7\right\}$
- 279)  $\left\{-\frac{1}{3}, -8\right\}$       280)  $\left\{-\frac{1}{7}, 6\right\}$       281)  $\left\{\frac{3}{5}, \frac{2}{3}\right\}$       282)  $\left\{-\frac{1}{3}, 6\right\}$
- 283)  $-5v^4 + 6v^3 + 4v$       284)  $-6b^3 + b^2 - 6b$       285)  $v^4 + 7v^2 - v + 13$       286)  $k^3 + 7k^2 - k - 2$
- 287)  $7v^4 + 6v^3 + 7v$       288)  $5x^3 - 7x^2 - 3x + 7$       289)  $5x^4 + 8x^3 - 1$
- 290)  $-4r^4 - 15r + 16$       291)  $-7m^4 - m^3 + 15m$
- 292)  $-7p^4 - 3p^3 - 8p^2 - 2p + 1$       293)  $8x^3 + 9x^2 + 3x + 6$
- 294)  $6r^3 - r^2 - 14r - 1$       295)  $9n + 3$       296)  $6r + 6$
- 297)  $2n - 2$       298)  $6x^2 - 6x$       299)  $6n^2 - 5n + 1$       300)  $9k^2 + 6k - 3$
- 301)  $3x^2 - x - 2$       302)  $x^2 - 4$       303)  $2a^3 - 5a^2 - a - 6$       304)  $x^3 + x + 2$
- 305)  $9m^3 - 6m^2 + 1$       306)  $2p^3 - p^2 - 7p + 2$
- 307)  $3p^4 - 11p^3 + 12p^2 + 3p - 9$       308)  $9k^4 - 12k^3 - 14k^2 + 12k + 9$
- 309)  $v^4 - 5v^3 + 7v^2 - 6$       310)  $2x^4 - 2x^3 - 3x^2 - 8x - 3$       311)  $(7p^2 - 4)(3p + 7)$
- 312)  $(4p^2 + 5)(3p - 8)$       313)  $(7n^2 + 8)(6n - 7)$       314)  $(3x^2 + 8)(3x + 8)$
- 315)  $(3m^2 - 5)(3m - 8)$       316)  $(x^2 + 1)(6x + 5)$       317)  $3(n^2 - 6)(n + 1)$
- 318)  $4(5x^2 + 3)(x - 4)$       319)  $5(3r^2 - 4)(3r - 1)$       320)  $8(6x^2 - 7)(5x + 2)$
- 321)  $6(3a^2 - 7)(8a + 7)$       322)  $5(4n^2 + 5)(3n - 5)$       323)  $(6x + 1)(36x^2 - 6x + 1)$
- 324)  $(2x + 5)(4x^2 - 10x + 25)$       325)  $(2x + 1)(4x^2 - 2x + 1)$       326)  $(4x + 3)(16x^2 - 12x + 9)$
- 327)  $(3 + 4m)(9 - 12m + 16m^2)$       328)  $(1 + 4a)(1 - 4a + 16a^2)$       329)  $(5x + 1)(25x^2 - 5x + 1)$
- 330)  $(1 + 3x)(1 - 3x + 9x^2)$       331)  $(6x - 5)(36x^2 + 30x + 25)$       332)  $(4 - 3x)(16 + 12x + 9x^2)$
- 333)  $(5x - 6)(25x^2 + 30x + 36)$       334)  $(3x - 4)(9x^2 + 12x + 16)$       335)  $(m - 1)(m^2 + m + 1)$
- 336)  $(2u - 5)(4u^2 + 10u + 25)$       337)  $(5x - 4)(25x^2 + 20x + 16)$       338)  $(2x - 3)(4x^2 + 6x + 9)$
- 339)  $2(4x - 1)(16x^2 + 4x + 1)$       340)  $2(-x + 6)(x^2 + 6x + 36)$
- 341)  $3(5m + 6)(25m^2 - 30m + 36)$       342)  $4(3x + 2)(9x^2 - 6x + 4)$
- 343)  $3(u + 6)(u^2 - 6u + 36)$       344)  $2(2a + 1)(4a^2 - 2a + 1)$
- 345)  $4(-6 - 5x)(36 - 30x + 25x^2)$       346)  $4(4x + 5)(16x^2 - 20x + 25)$