

Summer Assignment

Evaluate each function.

1) $k(a) = -2|-3a| + 2$; Find $k(8)$

2) $f(t) = |t - 2| + 1$; Find $f(-6)$

3) $h(x) = x^3 + 2x^2$; Find $h(-1)$

4) $w(x) = 3^{-x}$; Find $w(1)$

5) $w(n) = 3^{2n-1} - 3$; Find $w(0)$

6) $h(x) = |-x + 2|$; Find $h(10)$

7) $h(n) = -5^{n+1} + 1$; Find $h(-3n)$

8) $w(n) = n^2 + 1$; Find $w(n - 1)$

9) $p(n) = |n + 3|$; Find $p(n + 2)$

10) $k(x) = x^2 - 2$; Find $k(-2x)$

11) $h(x) = 2^{2x} - 3$; Find $h(2 - x)$

12) $g(x) = -x^3 + 2x^2$; Find $g\left(\frac{x}{2}\right)$

Perform the indicated operation.

13) $h(t) = t^2 + 2t$
 $g(t) = 2t - 4$
Find $\left(\frac{h}{g}\right)(t)$

14) $f(a) = 3a + 5$
 $g(a) = a^2 + 4a$
Find $(f + g)(a)$

15) $g(n) = 3n + 2$
 $h(n) = 3n$
 Find $(g \cdot h)(n)$

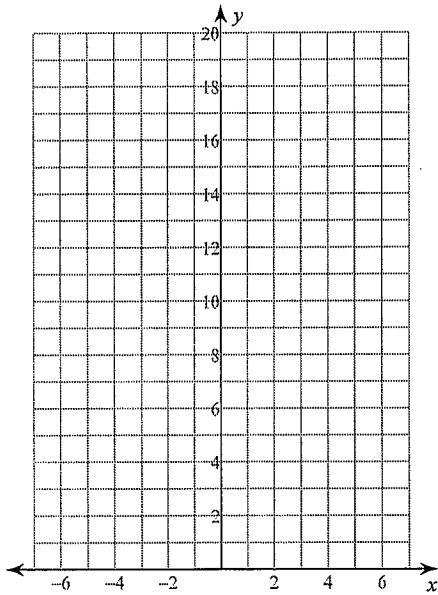
16) $f(a) = a^3 + 5a$
 $g(a) = 3a + 1$
 Find $(f - g)(a)$

17) $f(t) = 2t + 3$
 $g(t) = t^3 - 3 - 2t$
 Find $(-4f + g)(t)$

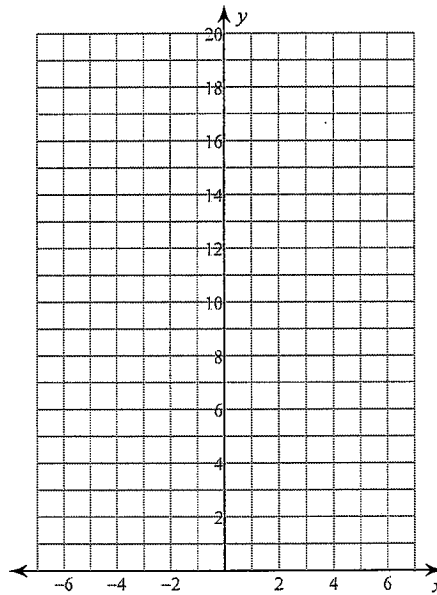
18) $f(x) = 4x - 1$
 $g(x) = 3x + 2$
 Find $(5f + 2g)(x)$

Sketch the graph of each function.

19) $y = 5 \cdot 2^x$

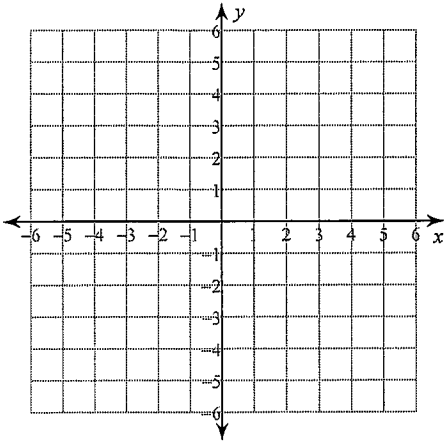


20) $y = 2 \cdot \left(\frac{1}{3}\right)^x$

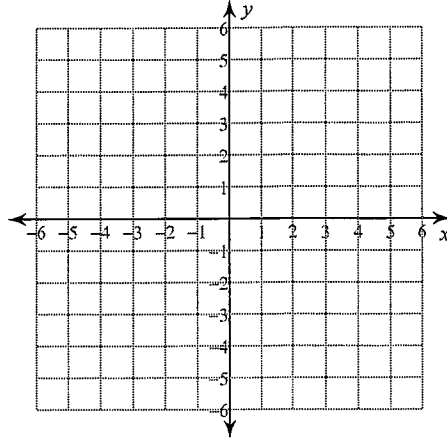


Sketch the graph of each line.

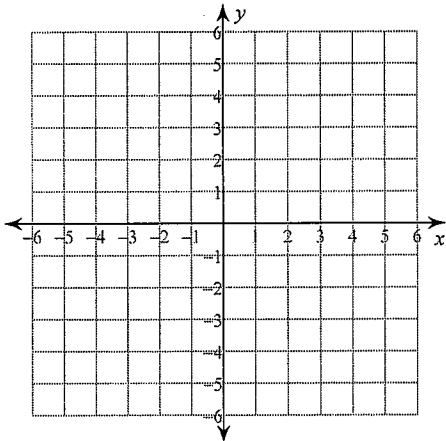
21) $x - 2y = -6$



22) $x + 5y = -5$

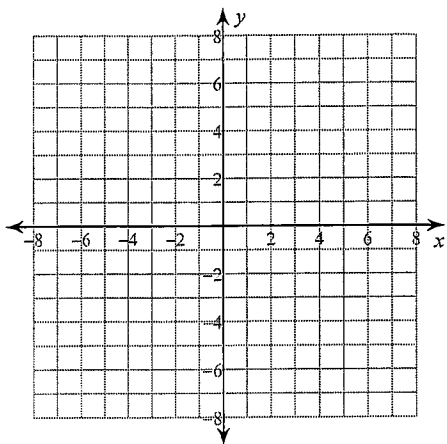


23) $7x - 2y = 6$

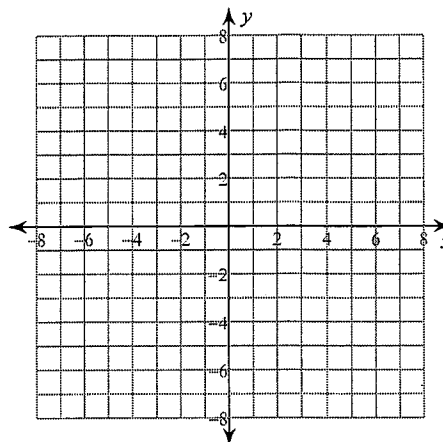


Identify the vertex and axis of symmetry of each. Then sketch the graph.

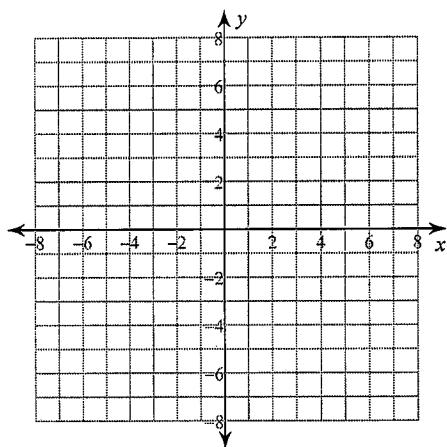
24) $y = 2x^2 - 5$



25) $y = \frac{1}{4}(x - 1)^2 - 3$



26) $y = \frac{1}{4}(x - 7)(x + 2)$



Find the absolute value of each complex number.

27) $|-10 + 4i|$

28) $|2 - 7i|$

29) $|9i|$

30) $|-2 - i|$

31) $|5i|$

32) $|-4 + 6i|$

Find the value that completes the square and then rewrite as a perfect square.

33) $x^2 - 16x + \underline{\hspace{1cm}}$

34) $r^2 + \frac{35}{18}r + \underline{\hspace{1cm}}$

35) $m^2 - \frac{1}{5}m + \underline{\hspace{1cm}}$

36) $a^2 + 14a + \underline{\hspace{1cm}}$

Solve each equation by completing the square.

37) $x^2 + 2x - 57 = -4$

38) $n^2 + 14n - 48 = 9$

39) $r^2 + 20r + 83 = -8$

40) $n^2 + 4n - 70 = 7$

Simplify each expression.

41) $\frac{\frac{1}{2} - \frac{4}{u}}{16}$

42) $\frac{\frac{25}{x} - \frac{x^2}{25}}{25}$

$$43) \frac{\frac{3}{x-2}}{\frac{3}{x-2} - \frac{x-2}{x+2}}$$

$$44) \frac{\frac{a^2}{4} - \frac{a}{4}}{\frac{1}{2}}$$

Find the discriminant of each quadratic equation then state the number and type of solutions.

$$45) b^2 + 6b = -9$$

$$46) -7x^2 - 10x - 11 = -4$$

$$47) -b^2 + 4b - 10 = -6$$

$$48) 9n^2 + 6n + 5 = 4$$

$$49) 7n^2 - 6n + 4 = 4$$

$$50) b^2 - 2b + 3 = 2$$

Divide.

$$51) (p^3 + p^2 - 14p + 10) \div (p - 2)$$

$$52) (10b^3 - 95b^2 - 58b + 79) \div (b - 10)$$

$$53) (x^3 - 5x^2 + 9x - 22) \div (x - 4)$$

$$54) (x^3 + 6x^2 - 46x - 53) \div (x + 10)$$

Simplify.

$$55) \frac{-5 - \sqrt{3}}{2\sqrt{9}}$$

$$56) \frac{2 - \sqrt{2}}{5\sqrt{16}}$$

$$57) \frac{5}{4 - 2\sqrt{5}}$$

$$58) \frac{4}{-2 - 4\sqrt{2}}$$

$$59) \frac{2\sqrt{5} + 2}{4\sqrt{3} - 2\sqrt{5}}$$

$$60) \frac{3 - \sqrt{3}}{2 - 3\sqrt{2}}$$

Simplify each expression.

$$61) \frac{6v^3 - 12v^2}{v - 2} \div \frac{8v^2}{v - 1}$$

$$62) \frac{3}{4k^2 + 36k} \div \frac{10k}{4k^2 + 36k}$$

$$63) \frac{30v^2 + 30v}{21v + 21} \div \frac{10v}{v - 10}$$

$$64) \frac{8}{16 - r^2} \div \frac{1}{r - 4}$$

Identify the domain and range of each.

$$65) y = \frac{2}{3}\sqrt{x} - 1$$

$$66) y = \sqrt{x - 1} + 4$$

$$67) y = \sqrt{x + 4} + 3$$

Solve each equation by factoring.

$$68) p^2 + 12p = -32$$

$$69) k^2 - 12 = -k$$

$$70) b^2 = 28 - 3b$$

$$71) p^2 = 7p$$

Solve each equation by taking square roots.

$$72) -1 + 36a^2 = 0$$

$$73) 10r^2 + 3 = -114$$

Solve each equation with the quadratic formula.

$$74) 7x^2 + 2 = 0$$

$$75) 4a^2 + 5 = 0$$

Solve each equation. Remember to check for extraneous solutions.

$$76) -8\sqrt{1 - 9v} = -64$$

$$77) -2\sqrt{7n + 7} = -14$$

$$78) -10\sqrt{5p + 64} = -80$$

$$79) \sqrt{3v - 29} = \sqrt{\frac{v}{10}}$$

$$80) 4x + 4 + \frac{1}{x} = \frac{4}{x}$$

$$81) \frac{n^2 + n - 6}{n^2} = \frac{1}{n} - \frac{n + 6}{3n}$$

$$82) \frac{v-2}{4v^2} + \frac{v^2+6v+8}{4v^2} = 1$$

$$83) \frac{1}{5x} + \frac{1}{5} = \frac{x+4}{5x^2}$$

Solve each equation.

$$84) -3643 = 2 - 5x^{\frac{3}{2}}$$

$$85) -x^{\frac{3}{2}} = -64$$

$$86) (2-m)^{\frac{4}{3}} = 16$$

$$87) (x+12)^{\frac{4}{3}} = 625$$

Simplify. Your answer should contain only positive exponents.

$$88) \frac{ab^{-4} \cdot 2a^2}{(2b^{-1})^3}$$

$$89) \frac{2u^3v^3 \cdot 2u^4v^4}{(2vu^{-2})^{-2}}$$

$$90) \frac{a^2b^3 \cdot a^3b^4}{(a^{-4}b^4)^3}$$

$$91) \frac{2x^4y^4}{2x^{-4}y^{-3} \cdot (x^{-1}y^2)^{-1}}$$

$$92) \frac{2m^3 n^{-4} \cdot (2m^{-4} n^4)^3}{2m^4 n^{-1}}$$

$$93) \frac{x^3 y^3 \cdot (2x^4 y^{-4})^2}{2x^{-4} y^{-1}}$$

$$94) \frac{2vu^4}{u^{-3} v^{-3} \cdot (u^4 v^4)^2}$$

$$95) \frac{m \cdot 2mn^{-2}}{(2m^3)^{-4}}$$

Factor each completely.

$$96) 15n^3 + 6n^2 - 25n - 10$$

$$97) 15x^3 + 9x^2 + 25x + 15$$

$$98) 7r^3 + 4r^2 - 49r - 28$$

$$99) 48m^3 - 30m^2 + 40m - 25$$

Factor each.

$$100) x^6 - 126x^3 + 125 = 0$$

$$101) x^6 + 4x^4 - 9x^2 - 36 = 0$$

$$102) x^6 - 64 = 0$$

$$103) x^6 - x^4 - x^2 + 1 = 0$$

Factor each completely.

104) $54x^3 + 250$

105) $a^3 + 27$

106) $m^3 + 8$

107) $27 + 8a^3$

Find all roots.

108) $(x - 2)(x + 2)(x^2 + 4)(3x^2 - 2)(3x^2 + 2) = 0$

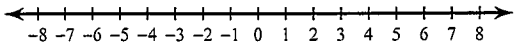
109) $(x - 2)(2x^2 + 1)(x^2 - 6) = 0$

110) $(2x - 1)(4x^2 + 2x + 1)(2x + 1)(4x^2 - 2x + 1) = 0$

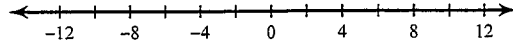
111) $(x^2 + 9)(2x^2 - 1) = 0$

Solve each inequality and graph its solution.

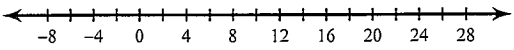
112) $|-2x| > 8$



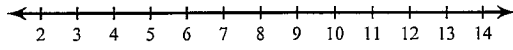
113) $|-4p| \geq 32$



114) $|x - 10| < 16$



115) $|r - 9| < 1$



Simplify.

116) $3\sqrt{2} - 2\sqrt{24} + 2\sqrt{2}$

117) $3\sqrt{8} + 3\sqrt{8} + 2\sqrt{18}$

118) $2\sqrt{2} - \sqrt{18} + 3\sqrt{24}$

119) $-2\sqrt{24} - 2\sqrt{8} + 3\sqrt{6}$

120) $\sqrt{3}(3 + \sqrt{3})$

121) $-4\sqrt{15}(\sqrt{2} + \sqrt{5})$

122) $(3\sqrt{3} - 3)(\sqrt{3} - 1)$

123) $(1 + \sqrt{3})(5 + \sqrt{3})$

Write each expression in exponential form.

124) \sqrt{n}

125) $(\sqrt[4]{v})^5$

126) $(\sqrt[3]{2a})^4$

127) $(\sqrt[5]{10r})^3$

128) $(\sqrt[3]{6p})^2$

129) $(\sqrt[6]{n})^5$

Solve each equation.

130) $-5(n-16)^{\frac{3}{2}} = -135$

131) $27 = n^{\frac{2}{3}} + 2$

132) $\frac{289}{32} = 9 + x^{-\frac{5}{6}}$

133) $-5 + (x+10)^{\frac{5}{4}} = 27$

Simplify.

134) $(v^2)^{\frac{3}{2}}$

135) $(64x^9)^{\frac{2}{3}}$

136) $(x^4)^{\frac{1}{4}}$

137) $(216k^3)^{\frac{5}{3}}$

138) $(27m^6)^{\frac{1}{3}}$

139) $(b^9)^{\frac{5}{3}}$

140) $(125a^6)^{\frac{2}{3}}$

141) $(64k^2)^{\frac{3}{2}}$

142) $(81v^6)^{\frac{1}{2}}$

143) $(k^3)^{\frac{5}{3}}$

Simplify. Your answer should contain only positive exponents with no fractional exponents in the denominator.

144) $3x^2y^2 \cdot 3x^{-\frac{1}{2}}y^{\frac{4}{3}} \cdot 3x^{-\frac{3}{2}}y^{\frac{3}{2}}$

145) $x^{\frac{2}{3}}y^{-1} \cdot y^{\frac{7}{4}}$

146) $2x^{-\frac{3}{4}}y^{-\frac{3}{4}} \cdot 2x^{\frac{5}{3}}y^{\frac{3}{2}}$

147) $2b^{\frac{5}{4}} \cdot 3a^{-\frac{1}{2}}b^{\frac{4}{3}}$

148) $xy^{\frac{3}{2}} \cdot 4y^{\frac{1}{2}}$

149) $2x^{\frac{3}{2}} \cdot 3x^{-\frac{2}{3}}y^{-\frac{1}{3}}$

Simplify each expression.

150) $\frac{6k}{3} - \frac{5k-3}{2k^2+6k}$

151) $\frac{4}{x-2} - \frac{2}{x+1}$

152) $\frac{3}{n+6} - \frac{6}{3n+1}$

153) $3 - \frac{x+6}{27x^3-27x^2}$

154) $\frac{\frac{u^2}{16}}{\frac{u^2}{9} - \frac{3}{u^2}}$

155) $\frac{\frac{1}{5}}{\frac{m+4}{m} + \frac{m+4}{25}}$

156) $\frac{\frac{4}{m-3} - \frac{m-3}{4}}{2m-6}$

157) $\frac{16}{\frac{4}{x} - \frac{1}{5}}$

Solve each equation. Remember to check for extraneous solutions.

$$158) \frac{2r-6}{r^2} + \frac{1}{r^2} = \frac{1}{r}$$

$$159) \frac{1}{n^2} = \frac{6n+5}{4n^2} + \frac{1}{4n^2}$$

$$160) \frac{1}{4} + \frac{1}{4r} = \frac{1}{2r}$$

$$161) \frac{3}{2} - \frac{1}{p} = 4$$

Simplify each expression.

$$162) \frac{x^2 - 4x - 12}{4} \cdot \frac{10}{10x + 20}$$

$$163) \frac{4n}{n+5} \cdot \frac{n^2 + 16n + 60}{4n^2 + 40n}$$

$$164) \frac{10x^2}{x+4} \cdot \frac{9x^2 + 36x}{x-4}$$

$$165) \frac{20b-60}{10} \cdot \frac{8}{18b^2-54b}$$

Simplify each and state the excluded values.

$$166) \frac{30x}{18x^2 + 24x}$$

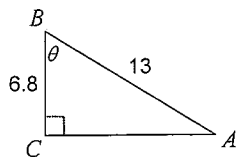
$$167) \frac{m^2 - 6m - 16}{m - 8}$$

$$168) \frac{10x + 20}{x + 2}$$

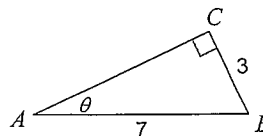
$$169) \frac{v + 8}{v^2 + 17v + 72}$$

Find the measure of each angle indicated. Round to the nearest tenth.

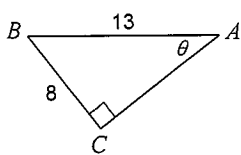
170)



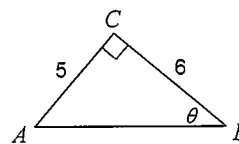
171)



172)

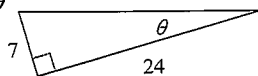


173)

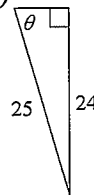


Find the value of the trig function indicated.

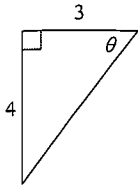
174) $\sin \theta$



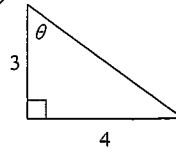
175) $\sin \theta$



176) $\sec \theta$

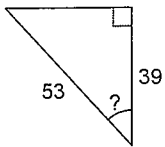


177) $\cos \theta$

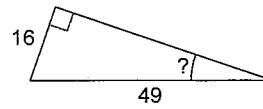


Find the measure of the indicated angle to the nearest degree.

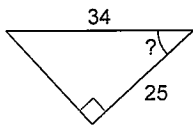
178)



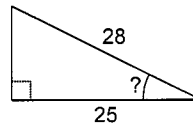
179)



180)



181)



Answers to Summer Assignment

1) -46

2) 9

3) 1

4) $\frac{1}{3}$

5) $-\frac{8}{3}$

6) 8

7) $-5^{-3n+1} + 1$

8) $n^2 - 2n + 2$

9) $|n + 5|$

10) $4x^2 - 2$

11) $2^{4-2x} - 3$

12) $-\frac{1}{8}x^3 + \frac{1}{2}x^2$

13) $\frac{t^2 + 2t}{2t - 4}$

14) $a^2 + 7a + 5$

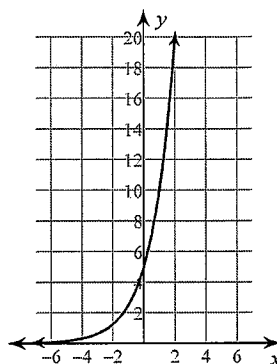
15) $9n^2 + 6n$

16) $a^3 + 2a - 1$

17) $t^3 - 10t - 15$

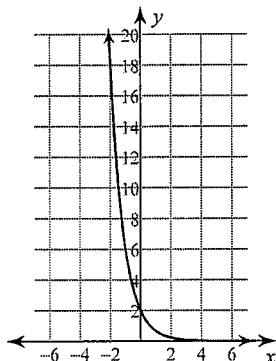
18) $26x - 1$

19)

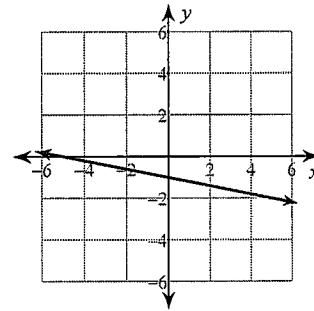
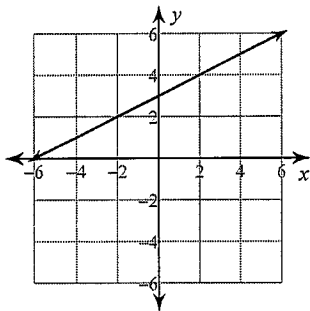


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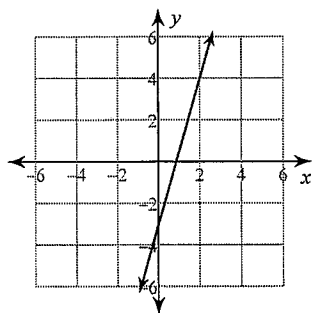
20)



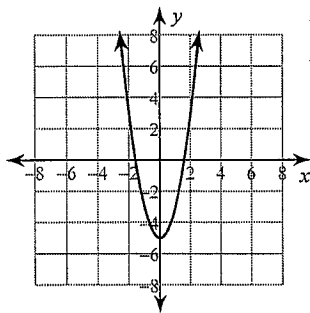
21)



23)

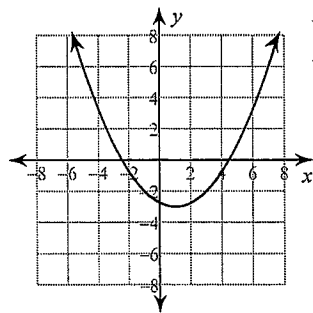


24)



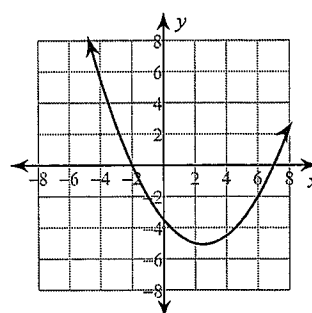
Vertex: $(0, -5)$
Axis of Sym.: $x = 0$

25)



Vertex: $(1, -3)$
Axis of Sym.: $x = 1$

26)



Vertex: $(\frac{5}{2}, -\frac{81}{16})$
Axis of Sym.: $x = \frac{5}{2}$

27) $2\sqrt{29}$

28) $\sqrt{53}$

29) 9

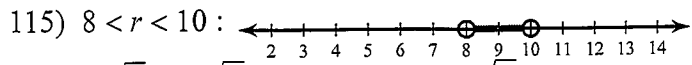
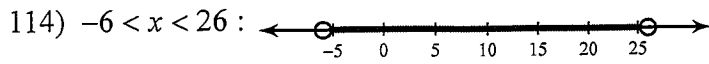
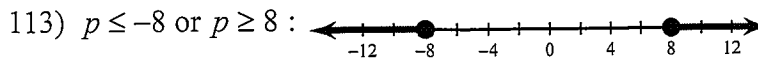
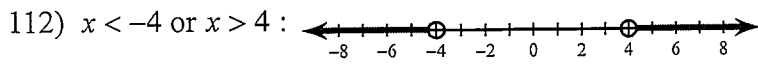
30) $\sqrt{5}$

31) 5

32) $2\sqrt{13}$

33) $64; (x - 8)^2$

- 34) $\frac{1225}{1296}; \left(r + \frac{35}{36}\right)^2$ 35) $\frac{1}{100}; \left(m - \frac{1}{10}\right)^2$ 36) $49; (a+7)^2$
- 37) $\{-1 + 3\sqrt{6}, -1 - 3\sqrt{6}\}$ 38) $\{-7 + \sqrt{106}, -7 - \sqrt{106}\}$ 39) $\{-7, -13\}$
- 40) $\{7, -11\}$ 41) $\frac{u-8}{32u}$ 42) $\frac{625-x^3}{625x}$ 43) $\frac{3x+6}{7x+2-x^2}$
- 44) $\frac{a^2-a}{2}$ 45) 0; one real solution
- 46) -96; two imaginary solutions 47) 0; one real solution
- 48) 0; one real solution 49) 36; two real solutions 50) 0; one real solution
- 51) $p^2 + 3p - 8 - \frac{6}{p-2}$ 52) $10b^2 + 5b - 8 - \frac{1}{b-10}$ 53) $x^2 - x + 5 - \frac{2}{x-4}$
- 54) $x^2 - 4x - 6 + \frac{7}{x+10}$ 55) $\frac{-5-\sqrt{3}}{6}$ 56) $\frac{2-\sqrt{2}}{20}$
- 57) $\frac{-10-5\sqrt{5}}{2}$ 58) $\frac{2-4\sqrt{2}}{7}$ 59) $\frac{2\sqrt{15}+5+2\sqrt{3}+\sqrt{5}}{7}$
- 60) $\frac{-6-9\sqrt{2}+2\sqrt{3}+3\sqrt{6}}{14}$ 61) $\frac{3(v-1)}{4}$ 62) $\frac{3}{10k}$
- 63) $\frac{v-10}{7}$ 64) $-\frac{8}{4+r}$ 65) Domain: $x \geq 0$ 66) Domain: $x \geq 1$
Range: $y \geq -1$ Range: $y \geq 4$
- 67) Domain: $x \geq -4$ 68) $\{-8, -4\}$ 69) $\{-4, 3\}$ 70) $\{-7, 4\}$
Range: $y \geq 3$
- 71) $\{7, 0\}$ 72) $\left\{\frac{1}{6}, -\frac{1}{6}\right\}$ 73) $\left\{\frac{3i\sqrt{130}}{10}, -\frac{3i\sqrt{130}}{10}\right\}$
- 74) $\left\{\frac{i\sqrt{14}}{7}, -\frac{i\sqrt{14}}{7}\right\}$ 75) $\left\{\frac{i\sqrt{5}}{2}, -\frac{i\sqrt{5}}{2}\right\}$ 76) $\{-7\}$ 77) $\{6\}$
- 78) $\{0\}$ 79) $\{10\}$ 80) $\left\{\frac{1}{2}, -\frac{3}{2}\right\}$ 81) $\left\{-3, \frac{3}{2}\right\}$
- 82) $\left\{3, -\frac{2}{3}\right\}$ 83) $\{2, -2\}$ 84) $\{81\}$ 85) $\{16\}$
- 86) $\{-6, 10\}$ 87) $\{113, -137\}$ 88) $\frac{a^3}{4b}$ 89) $16v^9u^3$
- 90) $\frac{a^{17}}{b^5}$ 91) x^7y^9 92) $\frac{8n^9}{m^{13}}$ 93) $\frac{2x^{15}}{y^4}$
- 94) $\frac{2}{uv^4}$ 95) $\frac{32m^{14}}{n^2}$ 96) $(3n^2-5)(5n+2)$ 97) $(3x^2+5)(5x+3)$
- 98) $(r^2-7)(7r+4)$ 99) $(6m^2+5)(8m-5)$ 100) $(x-1)(x^2+x+1)(x-5)(x^2+5x+25)=0$
- 101) $(x^2+4)(x^2-3)(x^2+3)=0$ 102) $(x-2)(x^2+2x+4)(x+2)(x^2-2x+4)=0$
- 103) $(x-1)^2 \cdot (x+1)^2(x^2+1)=0$ 104) $2(3x+5)(9x^2-15x+25)$
- 105) $(a+3)(a^2-3a+9)$ 106) $(m+2)(m^2-2m+4)$ 107) $(3+2a)(9-6a+4a^2)$
- 108) $\left\{2, -2, 2i, -2i, \frac{\sqrt{6}}{3}, -\frac{\sqrt{6}}{3}, \frac{i\sqrt{6}}{3}, -\frac{i\sqrt{6}}{3}\right\}$ 109) $\left\{2, \frac{i\sqrt{2}}{2}, -\frac{i\sqrt{2}}{2}, \sqrt{6}, -\sqrt{6}\right\}$
- 110) $\left\{\frac{1}{2}, \frac{-1+i\sqrt{3}}{4}, \frac{-1-i\sqrt{3}}{4}, -\frac{1}{2}, \frac{1+i\sqrt{3}}{4}, \frac{1-i\sqrt{3}}{4}\right\}$
- 111) $\left\{3i, -3i, \frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}\right\}$



116) $5\sqrt{2} - 4\sqrt{6}$

117) $18\sqrt{2}$

118) $-\sqrt{2} + 6\sqrt{6}$

119) $-\sqrt{6} - 4\sqrt{2}$

120) $3\sqrt{3} + 3$

121) $-4\sqrt{30} - 20\sqrt{3}$

122) $12 - 6\sqrt{3}$

123) $8 + 6\sqrt{3}$

124) $n^{\frac{1}{2}}$

125) $v^{\frac{5}{4}}$

126) $(2a)^{\frac{4}{3}}$

127) $(10r)^{\frac{3}{5}}$

128) $(6p)^{\frac{2}{3}}$

129) $n^{\frac{5}{6}}$

130) $\{25\}$

131) $\{125, -125\}$

132) $\{64\}$

133) $\{6\}$

134) v^3

135) $16x^6$

136) x

137) $7776k^5$

138) $3m^2$

139) b^{15}

140) $25a^4$

141) $512k^3$

142) $9v^3$

143) k^5

144) $27y^{\frac{29}{6}}$

145) $x^{\frac{2}{3}}y^{\frac{3}{4}}$

146) $4x^{\frac{11}{12}}y^{\frac{3}{4}}$

147) $\frac{6a^{\frac{1}{2}}b^{\frac{31}{12}}}{a}$

148) $4x \cdot y^2$

149) $\frac{6x^{\frac{5}{6}}y^{\frac{2}{3}}}{y}$

150) $\frac{4k^3 + 12k^2 - 5k + 3}{2k(k + 3)}$

151) $\frac{2x + 8}{(x - 2)(x + 1)}$

152) $\frac{3n - 33}{(n + 6)(3n + 1)}$

153) $\frac{81x^3 - 81x^2 - x - 6}{27x^2(x - 1)}$

154) $\frac{9u^4}{16u^4 - 432}$

155) $\frac{5m}{m^2 + 29m + 100}$

156) $\frac{-m^2 + 6m + 7}{8m^2 - 48m + 72}$

157) $\frac{80x}{20 - x}$

158) $\{5\}$

159) $\left\{-\frac{1}{3}\right\}$

160) $\{1\}$

161) $\left\{-\frac{2}{5}\right\}$

162) $\frac{x - 6}{4}$

163) $\frac{n + 6}{n + 5}$

164) $\frac{90x^3}{x - 4}$

165) $\frac{8}{9b}$

166) $\frac{5}{3x + 4}; \left\{0, -\frac{4}{3}\right\}$

167) $m + 2; \{8\}$

168) $10; \{-2\}$

169) $\frac{1}{v + 9}; \{-9, -8\}$

170) 58.5°

171) 25.4°

172) 38°

173) 39.8°

174) $\frac{7}{25}$

175) $\frac{24}{25}$

176) $\frac{5}{3}$

177) $\frac{3}{5}$

178) 43°

179) 19°

180) 43°

181) 27°