

June Exam Review Material

Solve each equation by completing the square.

1) $a^2 + 14a + 48 = 0$

2) $10n^2 + 20n - 30 = 0$

3) $n^2 - 6n - 58 = 0$

4) $8b^2 - 16b + 6 = 0$

5) $n^2 + 12n + 35 = 0$

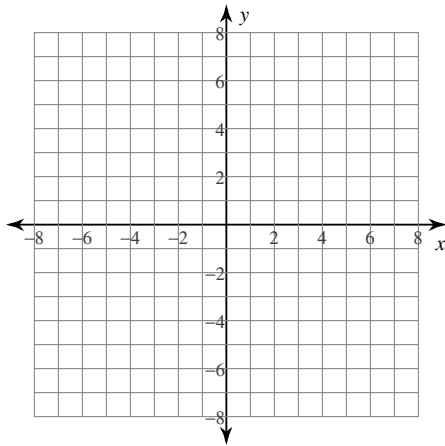
6) $3n^2 + 6n - 24 = 0$

7) $n^2 + 16n - 60 = -3$

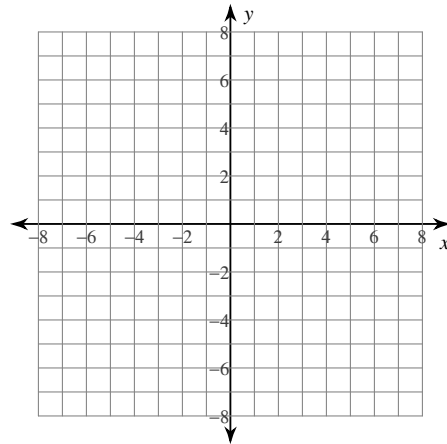
8) $2m^2 - 20m - 44 = -2$

Identify the vertex, axis of symmetry, direction of opening, min/max value, y-intercept, and x-intercepts of each. Then sketch the graph.

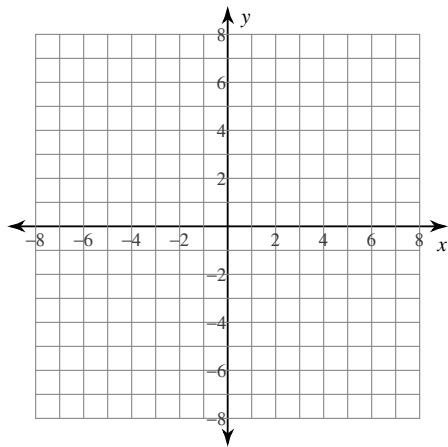
9) $y = -\frac{1}{3}x^2 + 2x - 4$



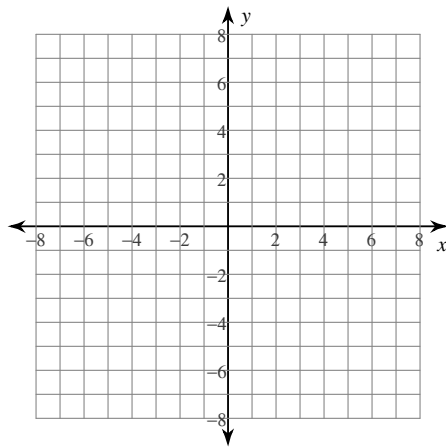
10) $y = -x^2 - 8x - 17$



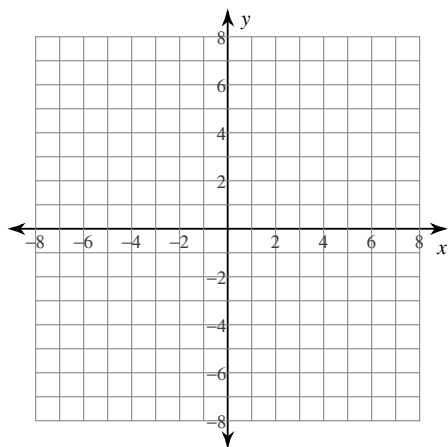
$$11) y = x^2 + 9x + 18$$



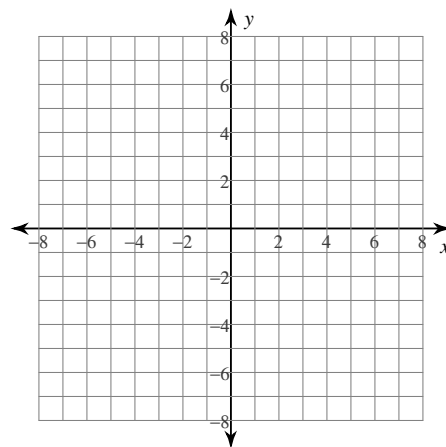
$$12) y = x^2 - 4x + 5$$



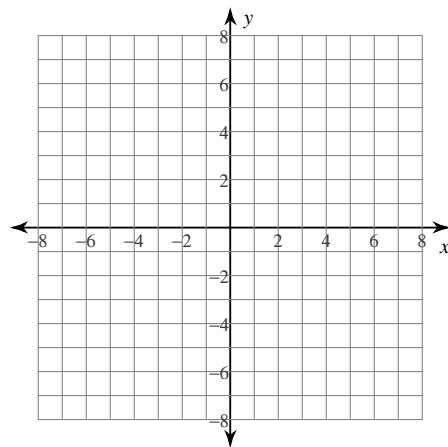
$$13) y = x^2 - 2x - 3$$



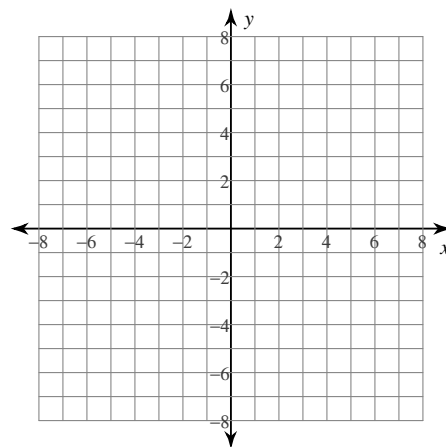
$$14) y = -(x + 3)^2$$



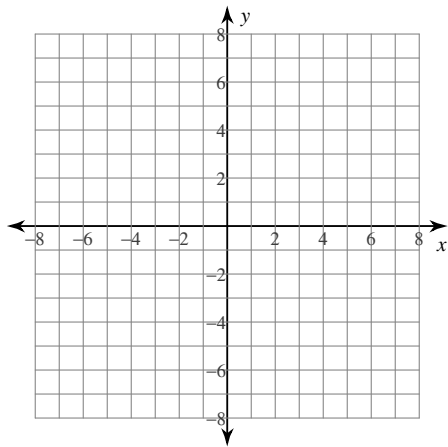
$$15) y = -\frac{1}{3}(x + 2)^2 + \frac{1}{3}$$



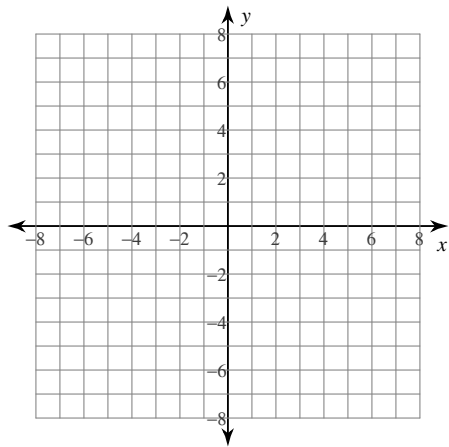
$$16) y = -(x - 5)^2$$



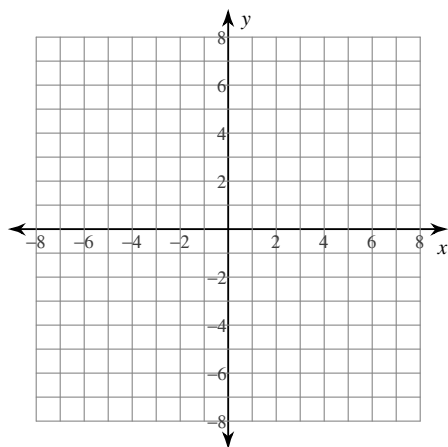
$$17) y = -(x+1)^2 - 1$$



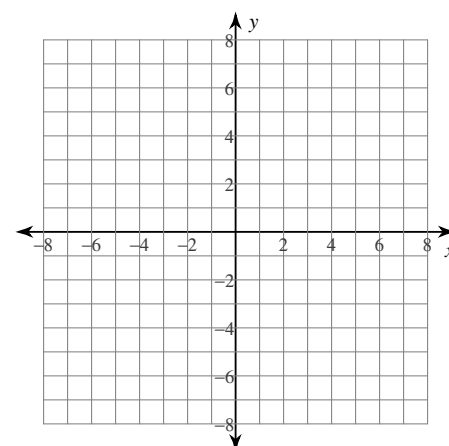
$$18) y + 4 = (x + 4)^2$$



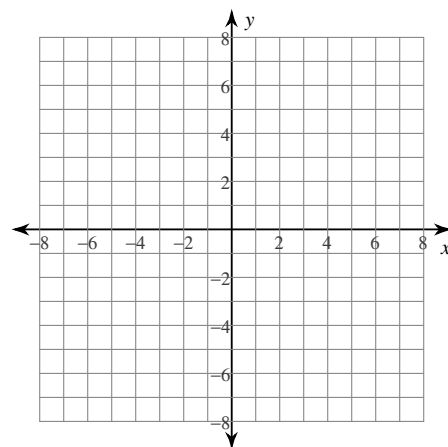
$$19) \frac{1}{2}y = (x+4)^2$$



$$20) 3\left(y + \frac{3}{4}\right) = \left(x + \frac{11}{2}\right)^2$$

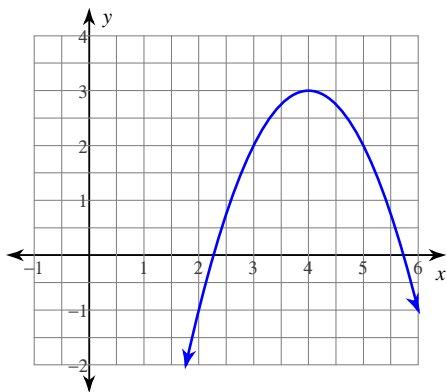


$$21) y + \frac{1}{4} = \left(x + \frac{1}{2}\right)^2$$

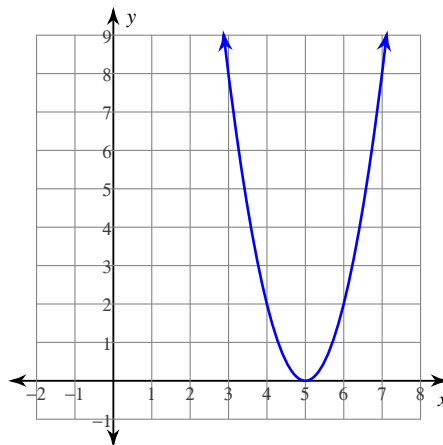


Use the information provided to write the transformational form equation of each parabola.

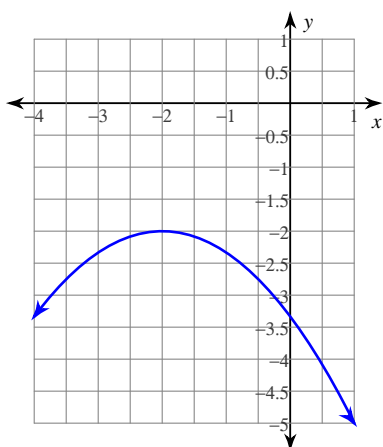
22)



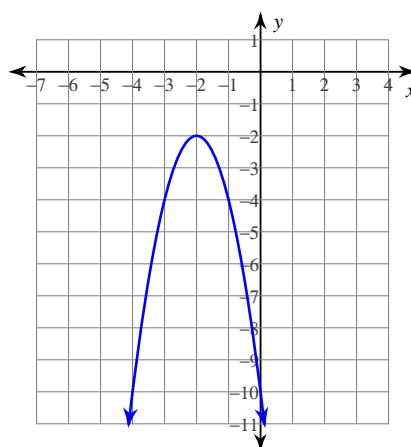
23)



24)



25)



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

26) $x^2 - 2x + 1 = 0$

27) $x^2 + x + 6 = 0$

28) $-2m^2 - 8m - 8 = 0$

29) $5x^2 - 3x + 2 = 0$

30) $4x^2 + 9x + 1 = 10$

31) $8n^2 - 9n - 4 = -4$

Solve each equation.

32) $\frac{\left(\frac{1}{81}\right)^{-2x}}{\frac{1}{243}} = 3^3$

33) $6^{3v-2} = 6^2$

34) $25^{-3p} \cdot 625^{2p+2} = 25$

35) $5^{-2x} = 1$

36) $25^{2x} = 625$

37) $36 \cdot 216^{-m} = 6^2$

Solve each equation. Round your answers to the nearest ten-thousandth.

38) $17^{x-7} = 52$

39) $4^{r-7} = 96$

40) $12^{n+6} = 60$

41) $12^{8x} = 77$

Solve each equation.

42) $\ln -5n = \ln (3 - 2n)$

43) $\log_6 (3v + 7) = \log_6 (4v + 6)$

44) $\log_{11} (7 - n) = \log_{11} (n - 5)$

45) $\log_{20} (n + 1) = \log_{20} (-n + 3)$

46) $\log_4 x - \log_4 2 = 3$

47) $\log_6 x - \log_6 3 = 2$

48) $\log_4 x - \log_4 3 = 2$

49) $\log x - \log 5 = \log 36$

50) $\log_8 x - \log_8 9 = 1$

Solve each equation by completing the square.

51) $10p^2 - 20p - 30 = 0$

52) $x^2 - 6x - 92 = 0$

53) $x^2 + 4x - 5 = 0$

54) $2n^2 + 20n - 22 = 0$

55) $b^2 - 8b - 74 = 0$

56) $5b^2 - 10b - 40 = 0$

Solve each equation by factoring.

57) $k^2 + k - 20 = 0$

58) $x^2 + 13x + 42 = 0$

59) $v^2 + 3v = 0$

60) $x^2 - 16 = 0$

61) $n^2 + 3n - 26 = 2$

62) $k^2 - k - 62 = -6$

Solve each equation with the quadratic formula.

63) $-8v^2 - 2v - 8 = 0$

64) $7n^2 + 9n - 10 = 0$

65) $5p^2 - 3p + 12 = 0$

Solve each equation.

66) $-250 = -2n^{\frac{3}{2}}$

67) $-7 + n^{\frac{1}{4}} = -5$

68) $512 = (1 - 21m)^{\frac{3}{2}}$

69) $-3r^{\frac{1}{3}} = -12$

70) $3 + (n - 21)^{\frac{6}{5}} = 67$

71) $(3r - 52)^{\frac{4}{3}} = 16$

72) $2k^{\frac{4}{3}} = 162$

73) $512 = (64 - 5x)^{\frac{3}{2}}$

74) $625^v = 125^{2v-2}$

75) $64^{2r} = 16^{3r}$

76) $625^x = 125^{-x}$

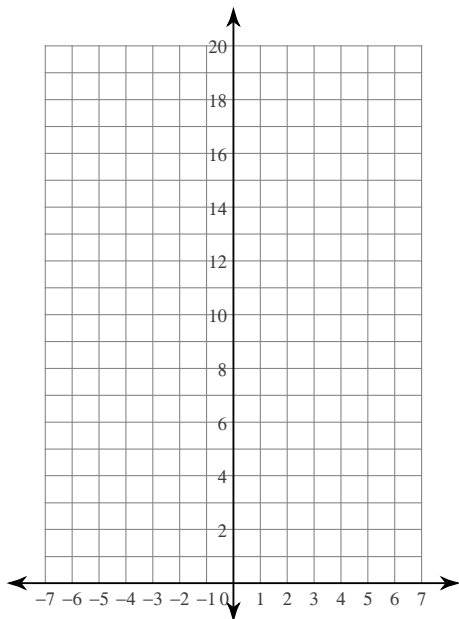
77) $81^{3n} = \frac{1}{243}$

78) $5^{2n} = 25$

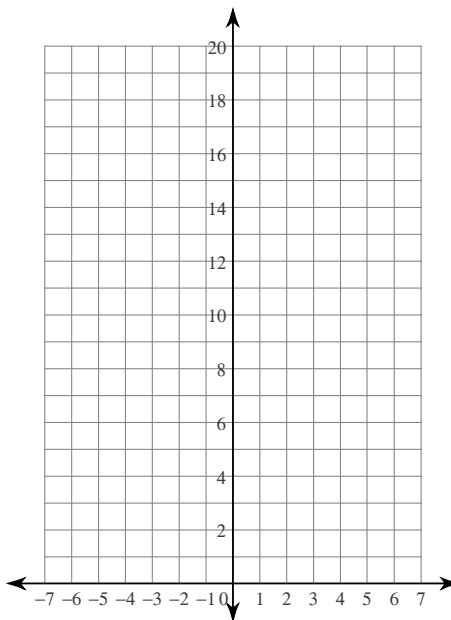
79) $625^{-2v-3} = 25^v$

Sketch the graph of each function.

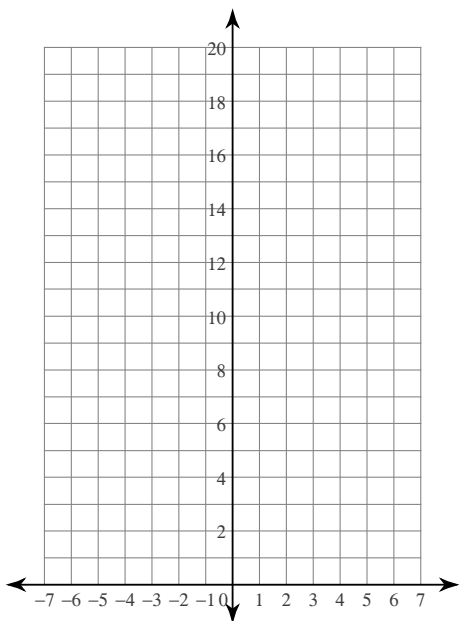
80) $y = 4 \cdot \left(\frac{1}{2}\right)^x$



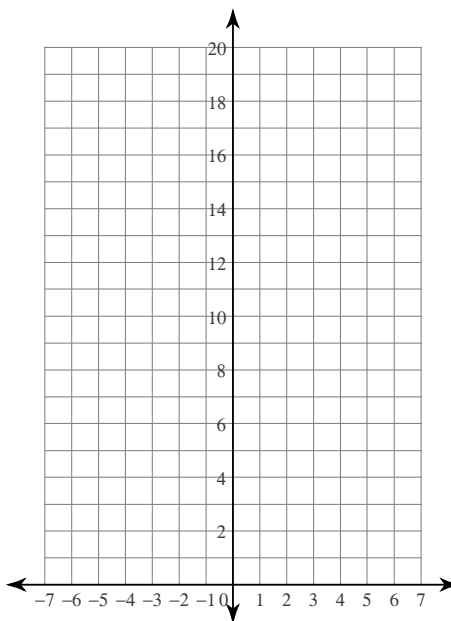
81) $y = \frac{1}{4} \cdot 5^x$



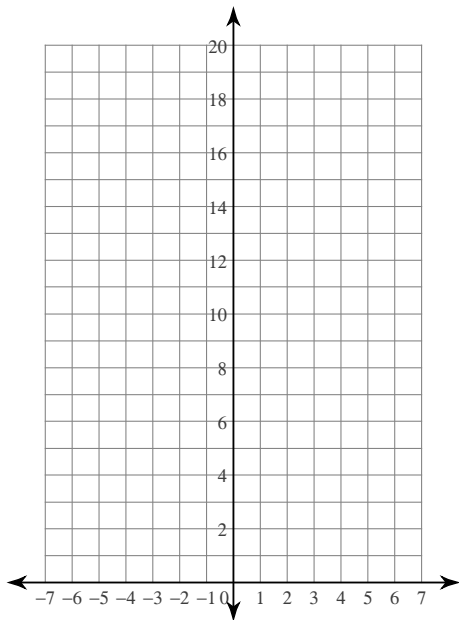
82) $y = 3 \cdot 2^x$



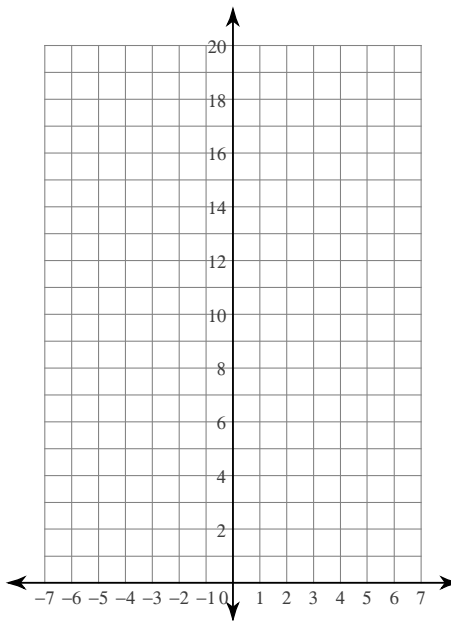
83) $y = 2 \cdot 2^x$



$$84) y = 2 \cdot \left(\frac{1}{2}\right)^x$$



$$85) y = \frac{1}{2} \cdot 3^x$$



Simplify. Your answer should contain only positive exponents.

$$86) \frac{(2xy^2)^4 y^2}{x^3 y^2}$$

$$87) \frac{(m^4 n^{-4})^{-3}}{mn^3 \cdot m^3 n^{-4}}$$

$$88) \frac{mn^{-1}}{(2n^{-1})^{-2} (2m^2 n^{-4})^0}$$

$$89) \left(\frac{xy^{-4}}{2x^2 \cdot 2xy^{-2}}\right)^4$$

$$90) \left(\frac{a^4 b^2}{2a^3 b^3 \cdot ab^0}\right)^{-2}$$

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

Factor each completely.

$$92) m^2 + 3m - 18$$

$$93) r^2 - 18r + 80$$

$$94) n^2 - 3n + 2$$

$$95) n^3 - 9n^2$$

$$96) 2x^2 + 6x$$

$$97) x^3 - 5x^2 - 6x$$

Evaluate each function.

98) $f(x) = -3x$; Find $f(-1)$

99) $f(n) = -4n + 2$; Find $f(8)$

100) $f(t) = 2t + 5$; Find $f(-10)$

101) $p(t) = t^3 + 4t$; Find $p(2)$

102) $f(x) = 2x - 1$; Find $f(2)$

103) $g(n) = 2n + 5$; Find $g(-6)$

Given the first term and the common ratio of a geometric sequence find the 8th term, the term named in the problem, and the explicit formula.

104) $a_1 = 4$, $r = 2$
Find a_9

105) $a_1 = 2$, $r = 2$
Find a_{10}

106) $a_1 = 3$, $r = 2$
Find a_{11}

107) $a_1 = 3$, $r = 3$
Find a_{12}

Find the 8th term, the term named in the problem, and the explicit formula.

108) $-3, -12, -48, -192, \dots$
Find a_{10}

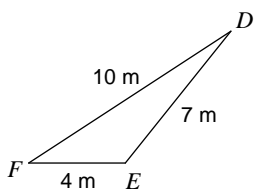
109) $1, 4, 16, 64, \dots$
Find a_{10}

110) $-1, 2, -4, 8, \dots$
Find a_{10}

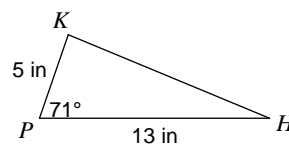
111) $4, -8, 16, -32, \dots$
Find a_{10}

Find the area of each triangle to the nearest tenth.

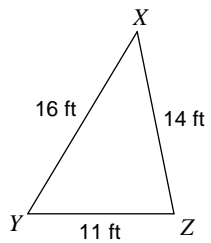
112)



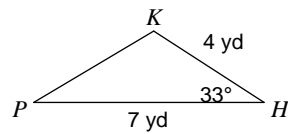
113)



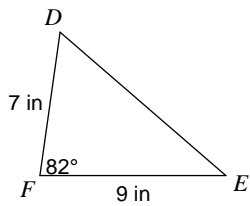
114)



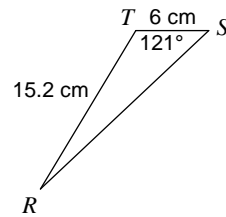
115)



116)



117)

**Evaluate each expression.**

118) $\log_7 1$

119) $\log_4 \frac{1}{16}$

120) $\log_7 49$

121) $\log_5 125$

122) $\log_7 343$

123) $\log_5 25$

124) $\log_6 216$

125) $\log_7 \frac{1}{343}$

Answers to June Exam Review Material

1) $\{-6, -8\}$

2) $\{1, -3\}$

3) $\{11.185, -5.185\}$

4) $\{1.5, 0.5\}$

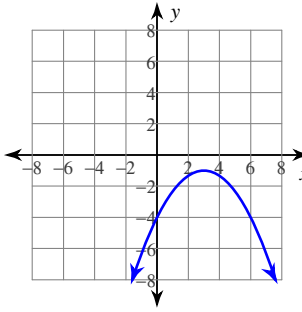
5) $\{-5, -7\}$

6) $\{2, -4\}$

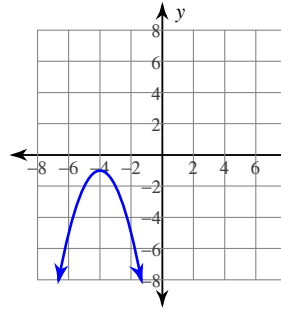
7) $\{3, -19\}$

8) $\{11.782, -1.782\}$

9)

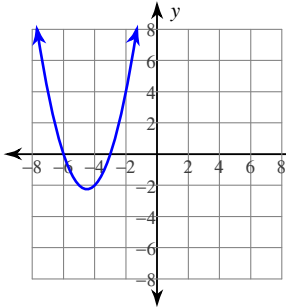


Vertex: $(3, -1)$
 Axis of Sym.: $x = 3$
 Opens: Down
 Max value = -1
 y-int: -4
 x-int: None



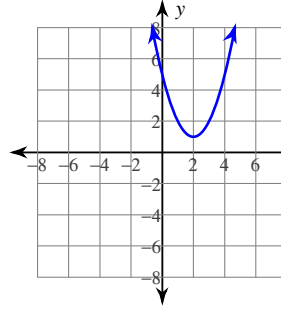
Vertex: $(-4, -1)$
 Axis of Sym.: $x = -4$
 Opens: Down
 Max value = -1
 y-int: -17
 x-int: None

11)



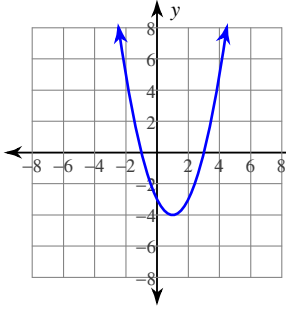
Vertex: $(-\frac{9}{2}, -\frac{9}{4})$
 Axis of Sym.: $x = -\frac{9}{2}$
 Opens: Up
 Min value = $-\frac{9}{4}$
 y-int: 18
 x-int: -3 and -6

12)



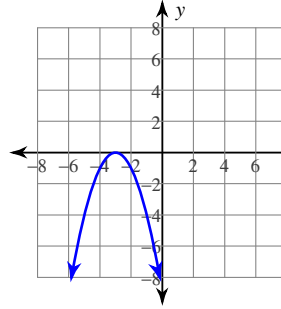
Vertex: $(2, 1)$
 Axis of Sym.: $x = 2$
 Opens: Up
 Min value = 1
 y-int: 5
 x-int: None

13)



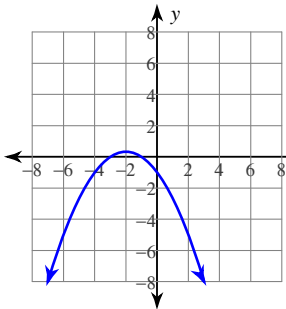
Vertex: $(1, -4)$
 Axis of Sym.: $x = 1$
 Opens: Up
 Min value = -4
 y-int: -3
 x-int: -1 and 3

14)



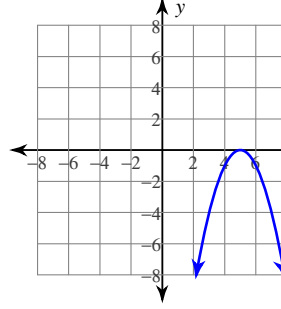
Vertex: $(-3, 0)$
 Axis of Sym.: $x = -3$
 Opens: Down
 Max value = 0
 y-int: -9
 x-int: -3

15)



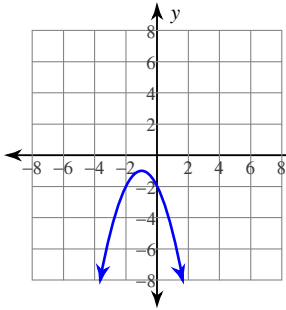
Vertex: $(-2, \frac{1}{3})$
 Axis of Sym.: $x = -2$
 Opens: Down
 Max value = $\frac{1}{3}$
 y-int: -1
 x-int: -3 and -1

16)



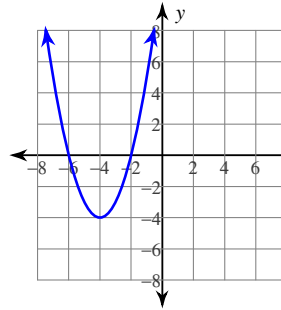
Vertex: $(5, 0)$
 Axis of Sym.: $x = 5$
 Opens: Down
 Max value = 0
 y-int: -25
 x-int: 5

17)



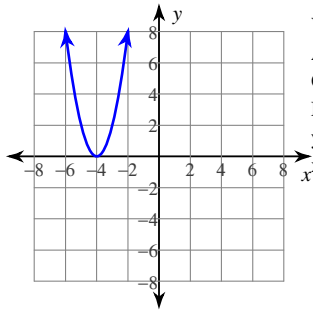
Vertex: $(-1, -1)$
 Axis of Sym.: $x = -1$
 Opens: Down
 Max value = -1
 y-int: -2
 x-int: None

18)



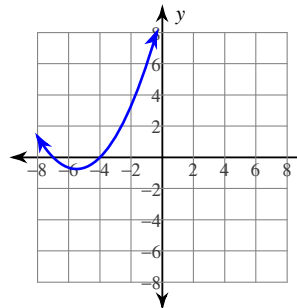
Vertex: $(-4, -4)$
 Axis of Sym.: $x = -4$
 Opens: Up
 Min value = -4
 y-int: 12
 x-int: -2 and -6

19)



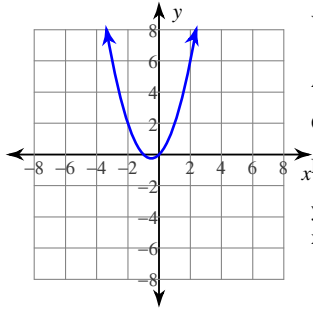
Vertex: $(-4, 0)$
 Axis of Sym.: $x = -4$
 Opens: Up
 Min value = 0
 y-int: 32
 x-int: -4

20)



Vertex: $(-\frac{11}{2}, -\frac{3}{4})$
 Axis of Sym.: $x = -\frac{11}{2}$
 Opens: Up
 Min value = $-\frac{3}{4}$
 y-int: $\frac{28}{3}$
 x-int: -4 and -7

21)



Vertex: $(-\frac{1}{2}, -\frac{1}{4})$
 Axis of Sym.: $x = -\frac{1}{2}$
 Opens: Up
 Min value = $-\frac{1}{4}$
 y-int: 0
 x-int: 0 and -1

22) $-(y-3) = (x-4)^2$

23) $\frac{1}{2}y = (x-5)^2$

24) $-3(y+2) = (x+2)^2$

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

26) 0; one real solution

27) -23; two imaginary solutions

28) 0; one real solution

29) -31; two imaginary solutions

30) 225; two real solutions

31) 81; two real solutions

32) $\left\{-\frac{1}{4}\right\}$

33) $\left\{\frac{4}{3}\right\}$

34) $\{-3\}$

35) $\{0\}$

36) $\{1\}$

37) $\{0\}$

38) 8.3946

39) 10.2925

40) -4.3523

41) 0.2185

42) $\{-1\}$

43) $\{1\}$

44) $\{6\}$

45) $\{1\}$

46) $\{128\}$

47) $\{108\}$

48) $\{48\}$

49) $\{180\}$

50) $\{72\}$

51) $\{3, -1\}$

52) $\{3 + \sqrt{101}, 3 - \sqrt{101}\}$

53) $\{1, -5\}$

54) $\{1, -11\}$

55) $\{4 + 3\sqrt{10}, 4 - 3\sqrt{10}\}$

56) $\{4, -2\}$

57) $\{-5, 4\}$

58) $\{-6, -7\}$

59) $\{-3, 0\}$

60) $\{-4, 4\}$

61) $\{4, -7\}$

62) $\{8, -7\}$

63) $\left\{\frac{-1 - 3i\sqrt{7}}{8}, \frac{-1 + 3i\sqrt{7}}{8}\right\}$

64) $\left\{\frac{5}{7}, -2\right\}$

65) $\left\{\frac{3 + i\sqrt{231}}{10}, \frac{3 - i\sqrt{231}}{10}\right\}$

66) $\{25\}$

67) $\{16\}$

68) $\{-3\}$

69) $\{64\}$

70) $\{53, -11\}$

71) $\left\{20, \frac{44}{3}\right\}$

72) $\{27, -27\}$

73) $\{0\}$

74) $\{3\}$

75) $\{\text{All real numbers.}\}$

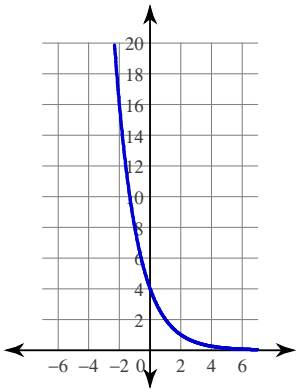
76) $\{0\}$

77) $\left\{-\frac{5}{12}\right\}$

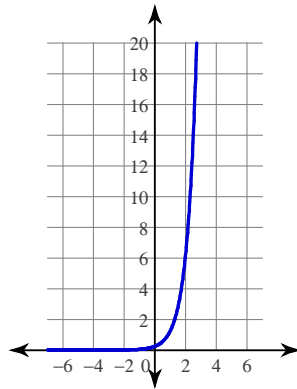
78) $\{1\}$

79) $\left\{-\frac{6}{5}\right\}$

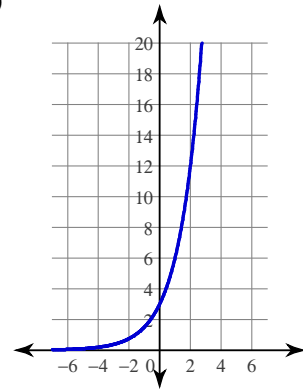
80)



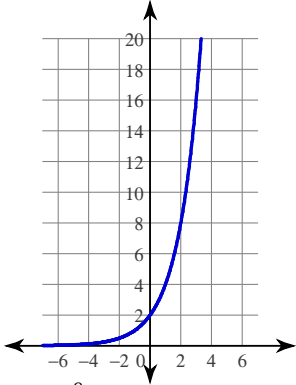
81)



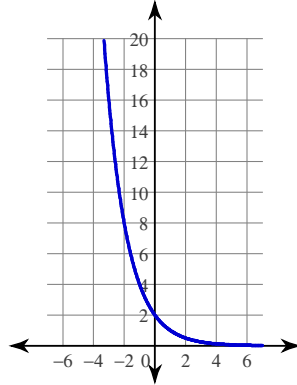
82)



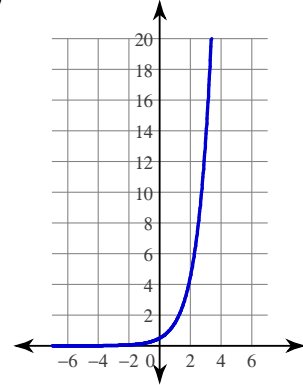
83)



84)



85)



86) $16xy^8$

87) $\frac{n^{13}}{m^{16}}$

88) $\frac{4m}{n^3}$

89) $\frac{1}{256y^8x^8}$

90) $4b^2$

91) $8x^{16}y^{13}$

92) $(m-3)(m+6)$

93) $(r-10)(r-8)$

94) $(n-2)(n-1)$

95) $n^2(n-9)$

96) $2x(x+3)$

97) $x(x+1)(x-6)$

98) 3

99) -30

100) -15

101) 16

102) 3

103) -7

104) $a_8 = 512$

$a_9 = 1024$

Explicit: $a_n = 4 \cdot 2^{n-1}$

105) $a_8 = 256$

$a_{10} = 1024$

Explicit: $a_n = 2 \cdot 2^{n-1}$

106) $a_8 = 384$

$a_{11} = 3072$

Explicit: $a_n = 3 \cdot 2^{n-1}$

107) $a_8 = 6561$

$a_{12} = 531441$

Explicit: $a_n = 3 \cdot 3^{n-1}$

108) $a_8 = -49152$

$a_{10} = -786432$

Explicit: $a_n = -3 \cdot 4^{n-1}$

109) $a_8 = 16384$

$a_{10} = 262144$

Explicit: $a_n = 4^{n-1}$

110) $a_8 = 128$

$a_{10} = 512$

Explicit: $a_n = -(-2)^{n-1}$

111) $a_8 = -512$

$a_{10} = -2048$

Explicit: $a_n = 4 \cdot (-2)^{n-1}$

112) 10.9 m^2

113) 30.7 in^2

114) 75.5 ft^2

115) 7.6 yd^2

116) 31.2 in^2

117) 39.1 cm^2

118) 0

119) -2

120) 2

121) 3

122) 3

123) 2

124) 3

125) -3