

Summer Assignment

© 2013 Kuta Software LLC. All rights reserved.

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

1) $13^{9b} + 2 = 33$

2) $8 \cdot 2^{x-7.7} = 94$

3) $16^{n-4} - 2 = 86$

4) $15^{8b} + 0.8 = 7$

5) $-10 \cdot 20^{x-2} = -81$

6) $11^{-7r} + 7 = 82$

7) $3 \cdot 12^{9v} = 83$

8) $-9 \cdot 19^{9x} = -7.6$

9) $-7 \cdot 19^{x-9} = -56$

10) $-5 \cdot 17^{n+7.2} = -37$

Solve each equation.

11) $2^{-2x} = 2^{-x}$

12) $216^{-3x} = 36$

13) $5^{3a} = 5^{-a}$

14) $81^{2-p} = 27$

15) $2^{3m-2} = 2^{2m}$

16) $3^{2n} = 3^{1-n}$

17) $\left(\frac{1}{1000000}\right)^{1-b} = 10^4$

18) $6^{-k} = 216$

19) $3^{-2r-3} = 3^{-2r}$

20) $216^{-n} = 36$

Condense each expression to a single logarithm.

21) $3\log_2 c + \frac{\log_2 a}{2}$

22) $\log_5 x + \log_5 y + 3\log_5 z$

23) $6\log_9 11 - 30\log_9 3$

24) $4\ln 11 + \frac{\ln 8}{3}$

25) $10\log_9 u + 2\log_9 v$

26) $12\log a + 6\log b$

27) $4\log_5 6 - 2\log_5 7$

28) $\log_3 7 + \log_3 8 + 3\log_3 5$

29) $5\log_6 8 + \frac{\log_6 5}{3}$

30) $2\log_4 8 + \frac{\log_4 5}{2}$

Identify the domain and range of each.

31) $y = \log_5 (4x + 1) + 3$

32) $y = \log_4 (4x + 5) + 4$

33) $y = \log_6 (4x + 14) - 4$

34) $y = \log_5 (4x - 4) - 3$

35) $y = \log (4x + 2) - 3$

36) $y = \log_6 (3x + 11) - 5$

Solve each equation.

37) $\log_{18} (x + 8) = \log_{18} 9$

38) $\log_8 (-4v - 1) = \log_8 (5 - 3v)$

39) $\ln (5 - 2a) = \ln (5a - 3)$

40) $\log_{15} 20 = \log_{15} 2x$

41) $\log (7 - 3k) = \log 28$

42) $\log_{11} (2b + 4) = \log_{11} (5b + 1)$

43) $\log 2 + \log (x^2 + 4) = 1$

44) $\log_8 6 - \log_8 5x = \log_8 66$

45) $\log_3 (x^2 + 5) - \log_3 5 = \log_3 65$

46) $\log 3 + \log (x^2 - 2) = \log 69$

$$47) \log_3 8 - \log_3 -4x = 3$$

$$48) \log_5 2 + \log_5 -5x = 2$$

$$49) \log_5 4x + \log_5 4 = 1$$

$$50) \log_8 2 + \log_8 -2x = 1$$

$$51) \log_3 (x - 3) - \log_3 6 = 1$$

$$52) \log_6 9 - \log_6 (x + 5) = 3$$

Expand each logarithm.

$$53) \log_6 (xy^5)^3$$

$$54) \log_7 \sqrt[3]{11 \cdot 8 \cdot 3}$$

$$55) \log_5 (2^3 \cdot 7^5)$$

$$56) \log_8 (12 \cdot 11^5)^5$$

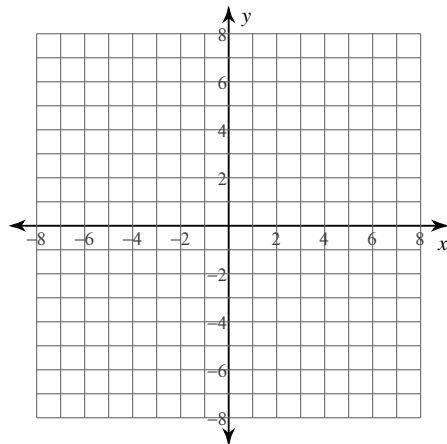
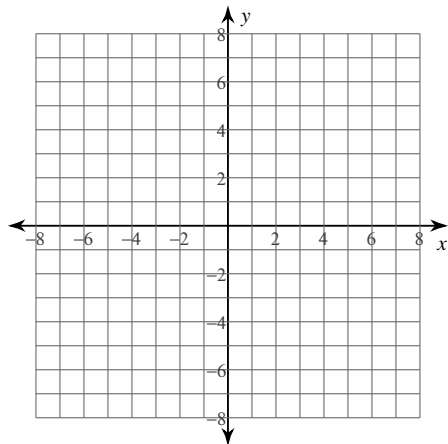
$$57) \log_7 (a^3 b^5)$$

$$58) \log_5 \sqrt{10 \cdot 11 \cdot 7}$$

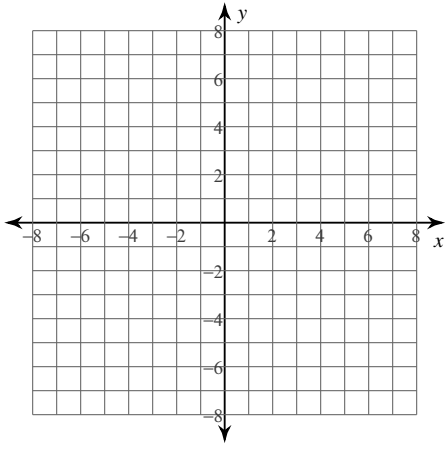
Identify the domain and range of each. Then sketch the graph.

$$59) y = \log (x - 1)$$

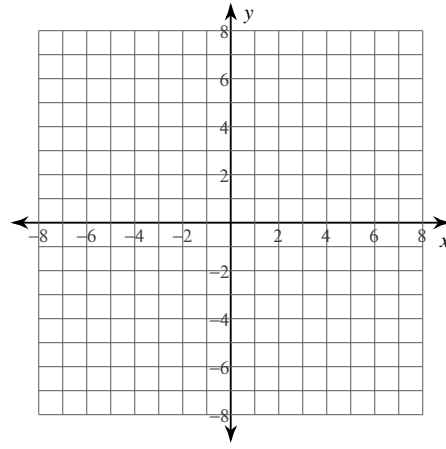
$$60) y = \log (x - 1) + 5$$



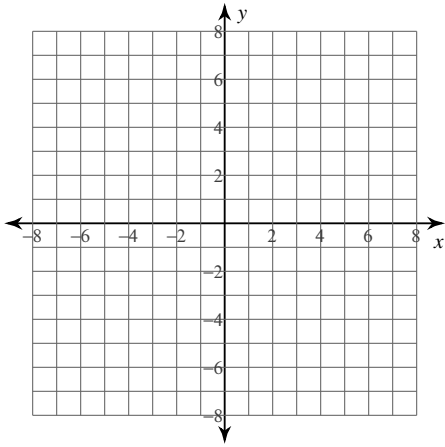
$$61) y = \log_5(x - 1) + 4$$



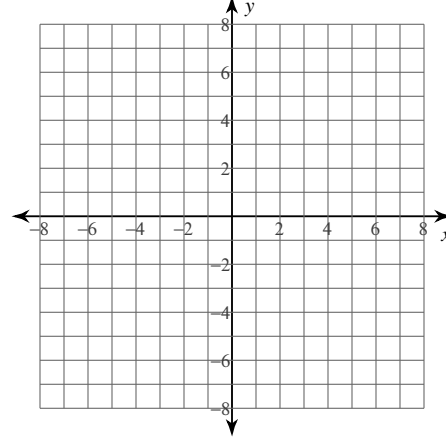
$$62) y = \log_4(x - 1) + 3$$



$$63) y = \log_4(x + 3) - 1$$

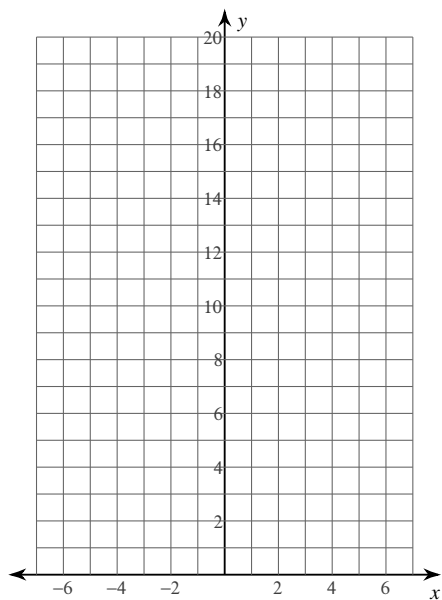


$$64) y = \ln(x - 2) - 2$$

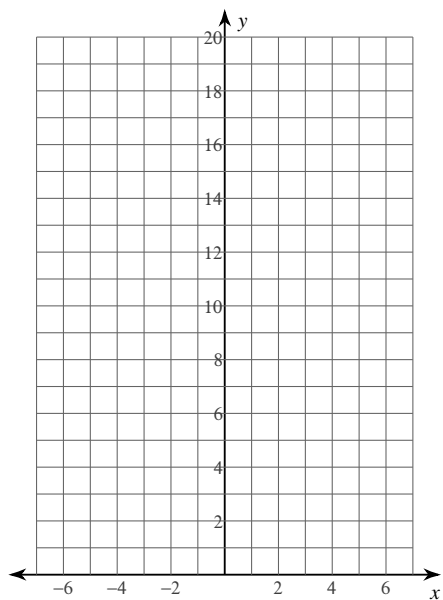


Sketch the graph of each function.

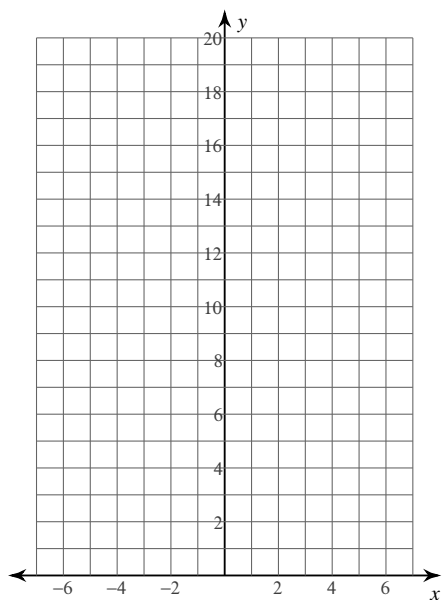
65) $y = \frac{1}{3} \cdot \left(\frac{1}{6}\right)^x$



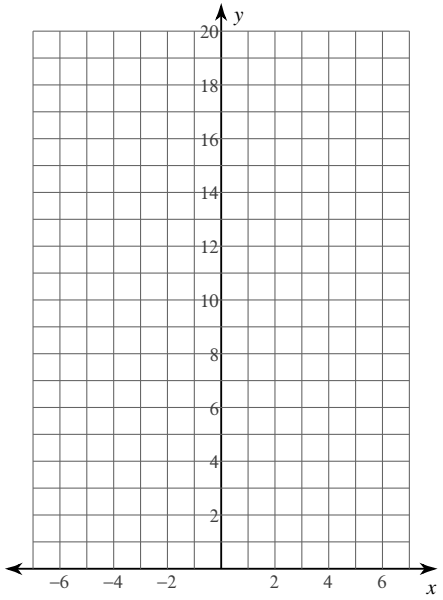
66) $y = \frac{1}{4} \cdot \left(\frac{1}{6}\right)^x$



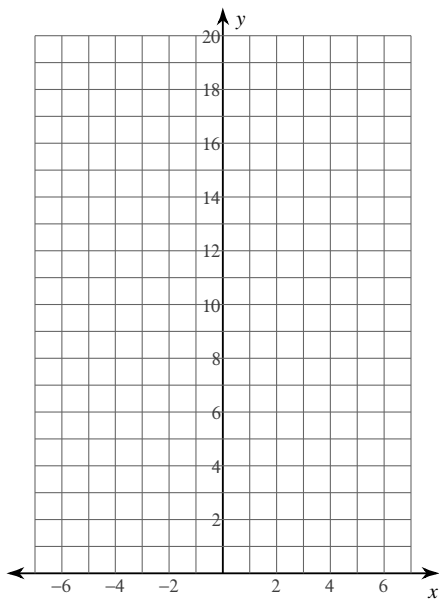
67) $y = \frac{1}{3} \cdot \left(\frac{1}{3}\right)^x$



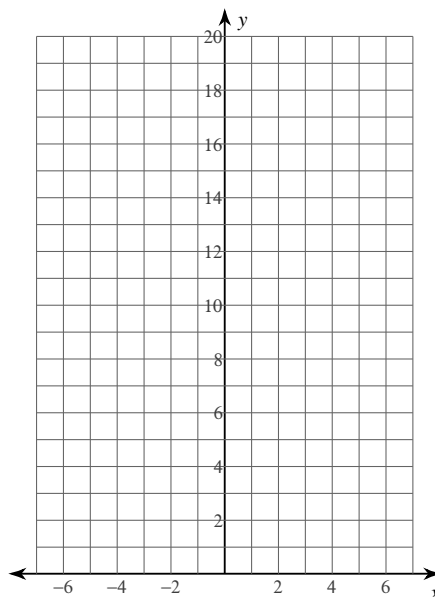
68) $y = \frac{1}{2} \cdot 6^x$



$$69) y = \frac{1}{3} \cdot 5^x$$



$$70) y = \frac{1}{4} \cdot \left(\frac{1}{5}\right)^x$$



Use a double-angle identity to find the exact value of each expression.

$$71) \cos \theta = \frac{12}{13} \text{ and } 0 < \theta < \frac{\pi}{2}$$

Find $\cos 2\theta$

$$72) \cos \theta = \frac{12}{13} \text{ and } \frac{3\pi}{2} < \theta < 2\pi$$

Find $\sin 2\theta$

$$73) \cos \theta = -\frac{12}{13} \text{ and } \pi < \theta < \frac{3\pi}{2}$$

Find $\sin 2\theta$

$$74) \cos \theta = \frac{4}{5} \text{ and } \frac{3\pi}{2} < \theta < 2\pi$$

Find $\cos 2\theta$

$$75) \cos \theta = -\frac{15}{17} \text{ and } \frac{\pi}{2} < \theta < \pi$$

Find $\sin 2\theta$

$$76) \cos \theta = \frac{5\sqrt{34}}{34} \text{ and } \frac{3\pi}{2} < \theta < 2\pi$$

Find $\sin 2\theta$

Solve each equation for $0 \leq \theta < 360$.

$$77) 3 - \frac{1}{3} \cdot \tan \theta = \frac{10}{3}$$

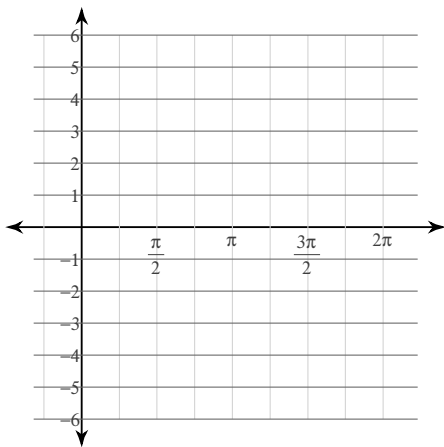
$$78) \frac{6 - \sqrt{3}}{2} = 3 - \frac{3}{2} \cdot \tan \theta$$

$$79) -4 - \frac{2}{5} \cdot \sin \theta = \frac{-20 + \sqrt{2}}{5}$$

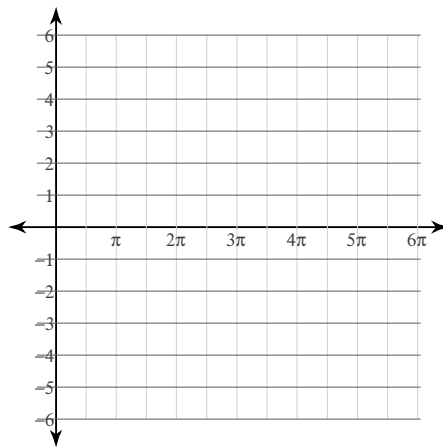
$$80) -5 = -5 + \frac{1}{4} \cdot \cos \theta$$

Graph each function using radians.

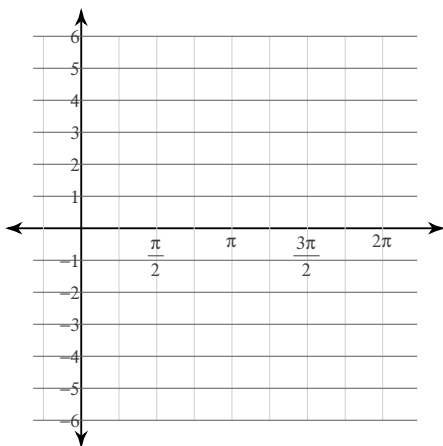
$$81) y = 2\sin\left(2\theta + \frac{\pi}{4}\right)$$



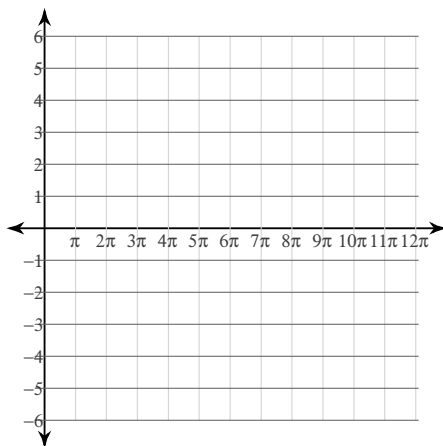
$$82) y = 2\sin\frac{\theta}{2}$$



$$83) y = 3\cos\left(4\theta - \frac{2\pi}{3}\right) + 2$$



$$84) y = 3\cos\left(\frac{\theta}{4} + \frac{\pi}{4}\right) + 1$$



Factor each.

$$85) f(x) = x^6 + 124x^3 - 125$$

$$86) f(x) = x^7 - 3x^5 - 16x^3 + 48x$$

$$87) f(x) = x^7 + x^5 - 25x^3 - 25x$$

$$88) f(x) = x^8 - 25x^4 + 144$$

89) $f(x) = x^6 - 1$

90) $f(x) = x^8 - 20x^4 + 64$

91) $f(x) = x^6 + 2x^4 - x^2 - 2$

92) $f(x) = x^6 - 2x^4 - 9x^2 + 18$

93) $f(x) = x^8 - 29x^4 + 100$

94) $f(x) = x^7 + 63x^4 - 64x$

95) $f(x) = x^8 - 34x^4 + 225$

96) $f(x) = x^7 + 26x^4 - 27x$

97) $f(x) = x^8 + 7x^5 - 8x^2$

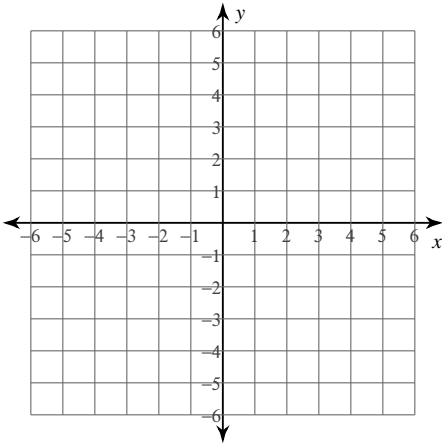
98) $f(x) = x^8 - 10x^4 + 9$

99) $f(x) = x^6 + 63x^3 - 64$

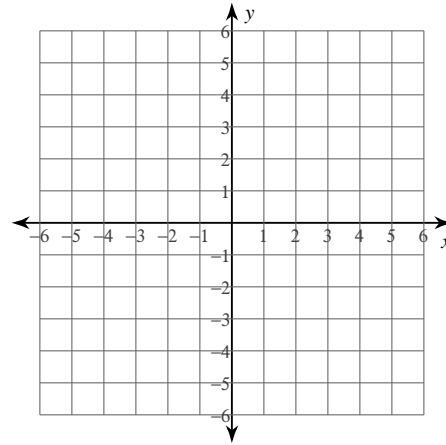
100) $f(x) = x^6 - 7x^3 - 8$

Graph each equation.

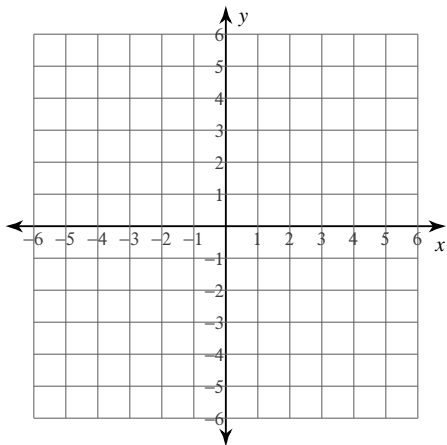
101) $y = 3|2x - 2|$



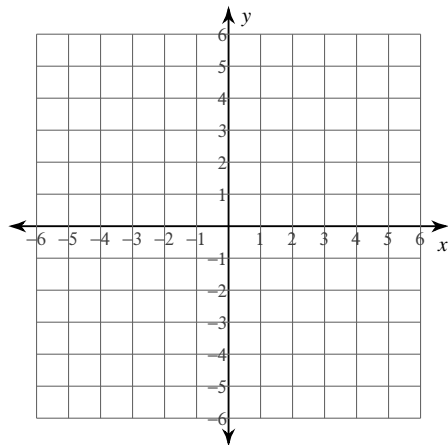
102) $y = 3|3x - 1|$



$$103) y = 2|2x| - 1$$

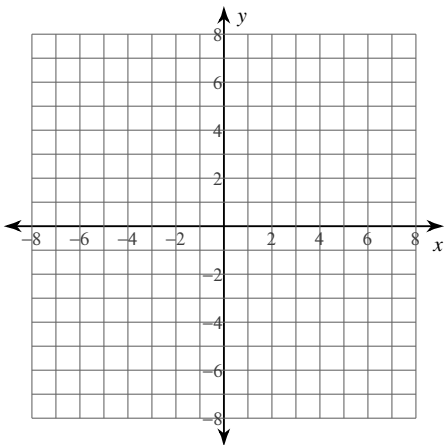


$$104) y = 3|2x - 2| - 1$$

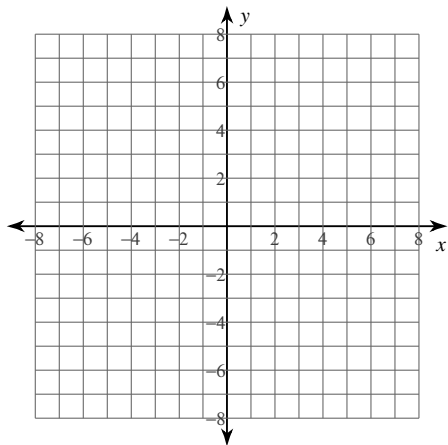


Identify the center and radius of each. Then sketch the graph.

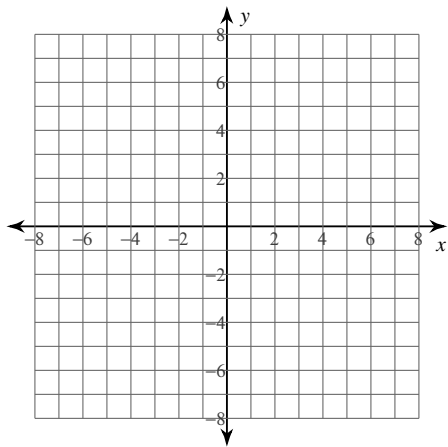
$$105) (x + 2)^2 + (y - 3)^2 = 16$$



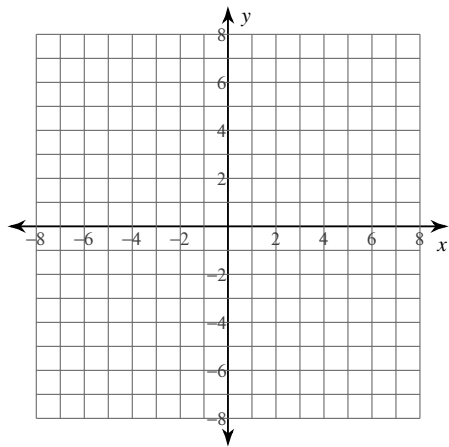
$$106) (x + 3)^2 + (y + 2)^2 = 9$$



$$107) (x + 3)^2 + (y - 4)^2 = 4$$

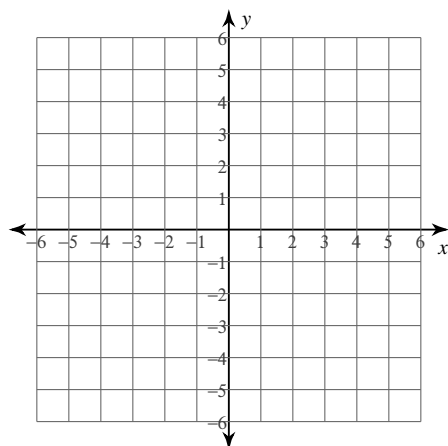


$$108) (x + 3)^2 + (y - 1)^2 = 9$$

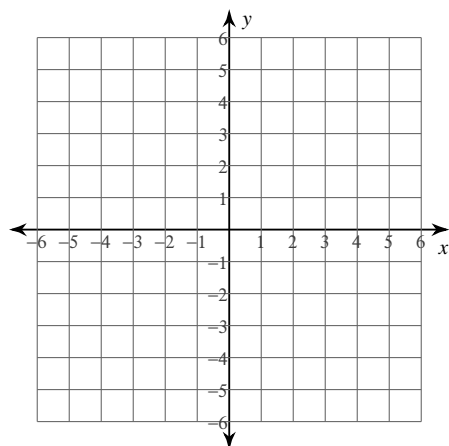


Sketch the graph of each line.

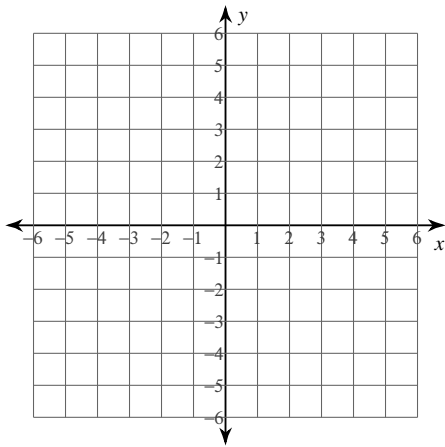
$$109) 20 + 10y = 2x$$



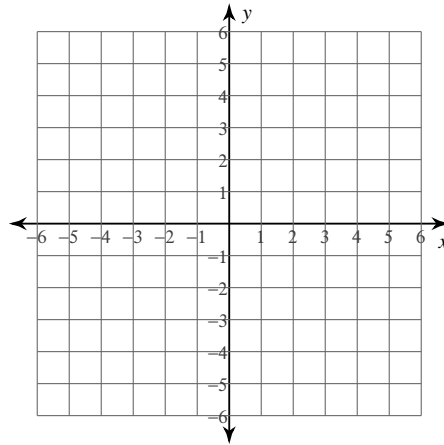
$$110) -y = -2x - 4$$



$$111) y + 3 + \frac{6}{5}x = 0$$

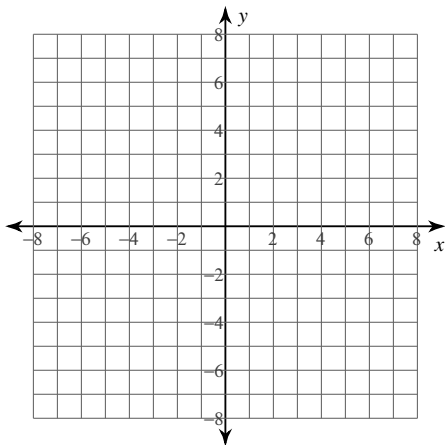


$$112) -3y - 15 = -2x$$

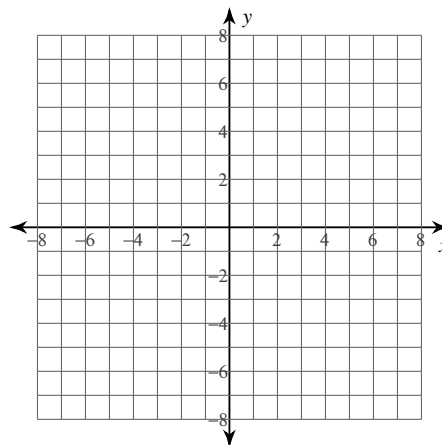


Identify the vertex, y-intercept, and x-intercepts of each. Then sketch the graph.

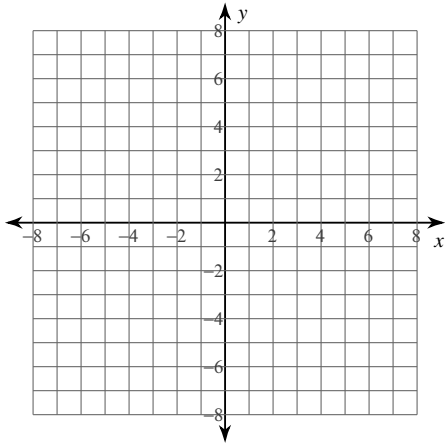
$$113) f(x) = x^2 - 12x + 38$$



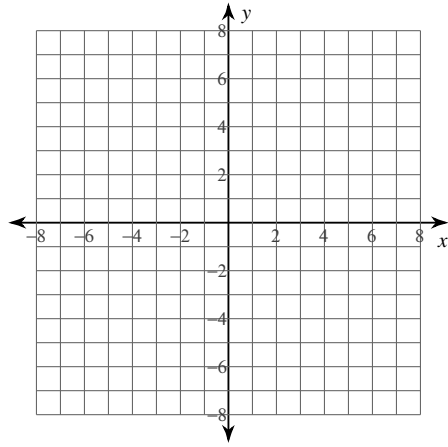
$$114) f(x) = 2x^2 + 10x + 12$$



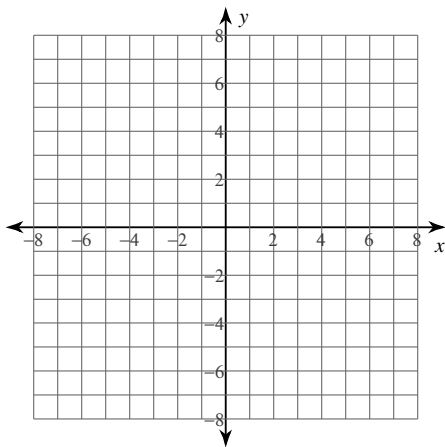
115) $f(x) = -x^2 + 7x - 10$



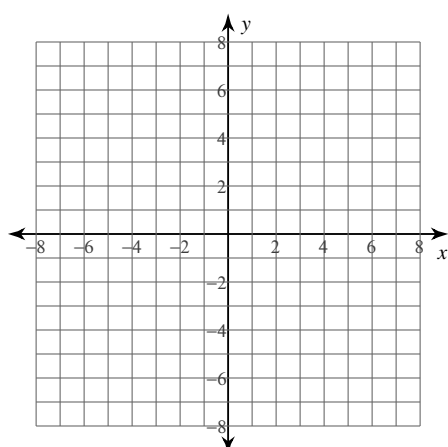
116) $f(x) = x^2 - 5x + 6$



117) $f(x) = 2x^2 + 8x$

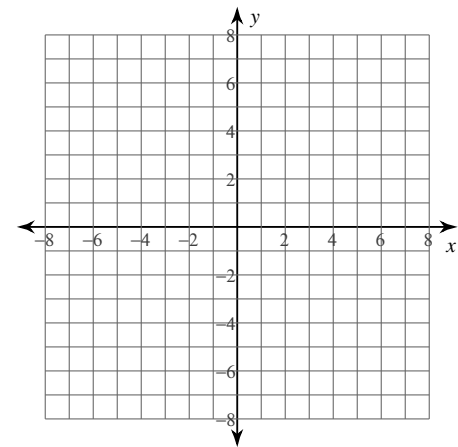


118) $f(x) = -x^2 - 7x - 12$

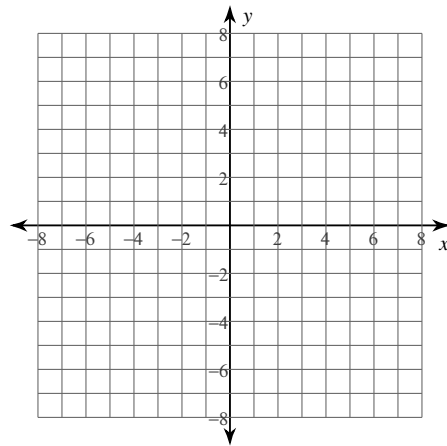


Sketch the graph of each function.

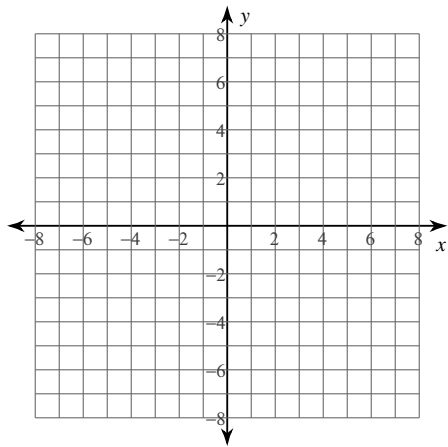
119) $y = \frac{1}{2}\sqrt{x}$



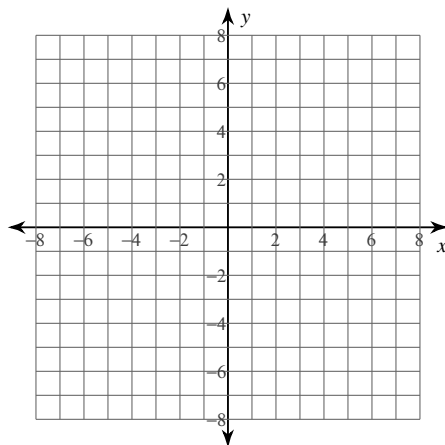
120) $y = \sqrt{x} + 4$



$$121) y = 2\sqrt{x}$$

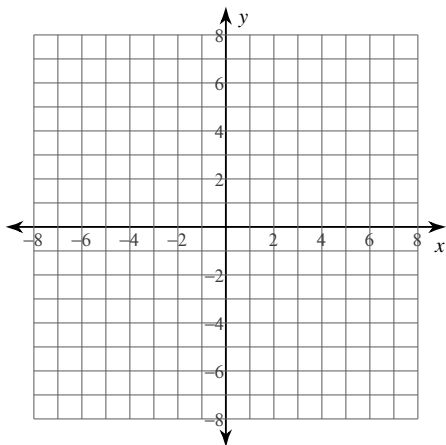


$$122) y = 5 + \frac{1}{2}\sqrt{x}$$

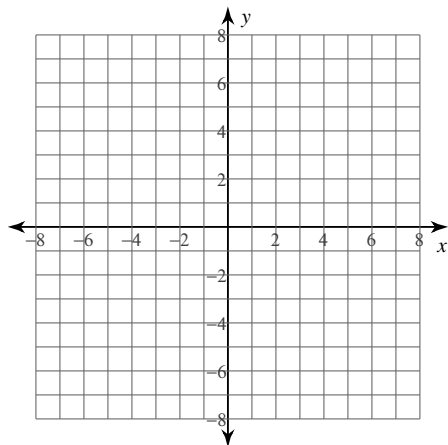


Graph each function.

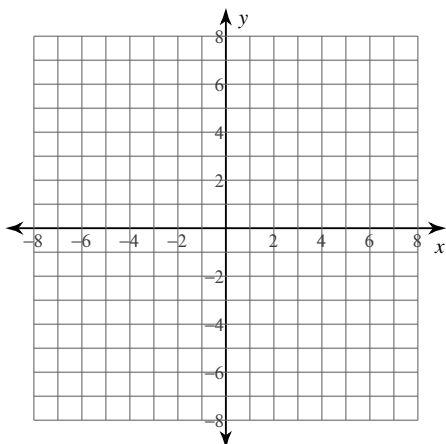
$$123) f(x) = \frac{1}{4x^2 - 8x - 12}$$



$$124) f(x) = \frac{x^2 - 6x + 8}{x^2 - x - 12}$$



$$125) f(x) = \frac{2x + 8}{x - 2}$$



$$126) f(x) = \frac{x^2 + 7x + 12}{2x^2 - 4x - 6}$$

