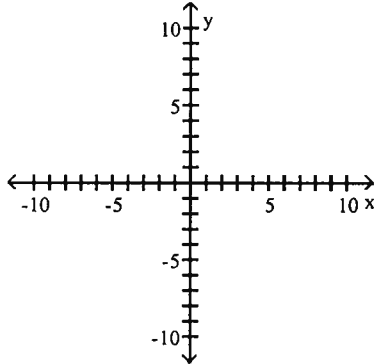Name_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Graph the function and give its domain and its range.
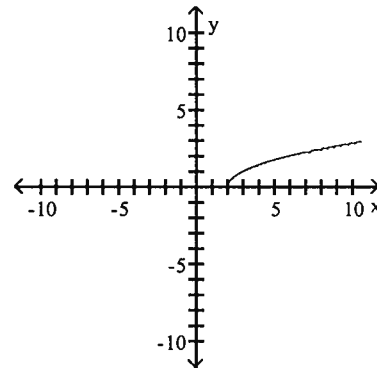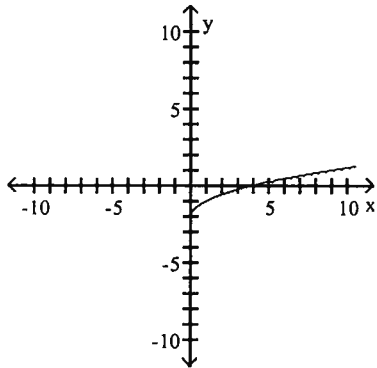
1) $f(x) = \sqrt{x + 2}$

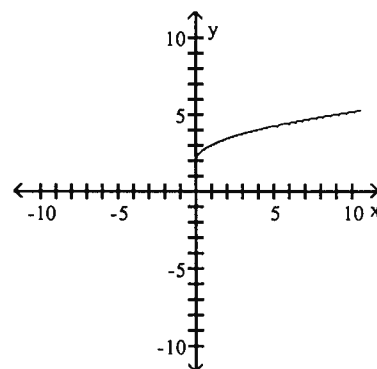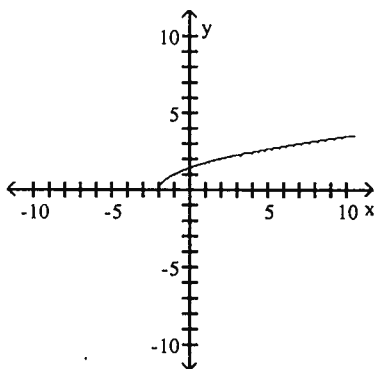1) _____

A) $[0, \infty); [-2, \infty)$ B) $[2, \infty); [0, \infty)$

C) $[-2, \infty); [0, \infty)$ D) $[0, \infty); [2, \infty)$

Simplify the expression involving rational exponents.

2) $\left(\dfrac{64}{49}\right)^{-1/2}$

2) _____

A) $\dfrac{7}{8}$ B) $\dfrac{32}{49}$

C) Not a real number   D) $\dfrac{8}{7}$

Simplify by first converting to rational exponents. Assume that all variables represent positive real numbers.

3) $\sqrt{z^6}$

3) _____

    A) z^3 B) $\dfrac{z}{2}$ C) $2z$ D) z^{12}

Express the radical in simplified form. Assume that all variables represent positive real numbers.

4) $-\sqrt{300k^7q^8}$

4) _____

    A) $10k^7q^8\sqrt{3k}$ B) $-10k^3q^4\sqrt{3k}$ C) $10k^3q^4\sqrt{3k}$ D) $-10k^3q^4\sqrt{3}$

Simplify. Assume that all variables represent positive real numbers.

5) $3\sqrt{7} + 5\sqrt{63}$

5) _____

    A) $12\sqrt{7}$ B) $18\sqrt{7}$ C) $8\sqrt{7}$ D) $-18\sqrt{7}$

Multiply, then simplify the product. Assume that all variables represent positive real numbers.

6) $(5 - 3\sqrt{5})^2$

6) _____

    A) $70 - 30\sqrt{5}$ B) $25 + 9\sqrt{5}$ C) $70 + 30\sqrt{5}$ D) $25 - 9\sqrt{5}$

Rationalize the denominator. Assume that all variables represent positive real numbers.

7) $\sqrt{\dfrac{98}{x}}$

7) _____

    A) $7\sqrt{2x}$ B) $\dfrac{7\sqrt{2x}}{x}$ C) $7\sqrt{\dfrac{2}{x}}$ D) $\dfrac{\sqrt{7x}}{x}$

Solve this equation.

8) $\sqrt{x + 7} + 5 = x$

8) _____

    A) $\{2\}$ B) $\{2, 9\}$ C) $\{9, 18\}$ D) $\{9\}$

Write the expression in the form a + bi.

9) $\dfrac{4 - 4i}{5 + 3i}$

9) _____

    A) $\dfrac{4}{17} - \dfrac{16}{17}i$ B) $-\dfrac{32}{17} + \dfrac{8}{17}i$ C) $\dfrac{4}{17} + \dfrac{16}{17}i$ D) $\dfrac{32}{17} + \dfrac{8}{17}i$

Find the power of i.

10) i^{14}

10) _____

    A) -1 B) i C) 1 D) $-i$

Use the square root property to solve the equation.

11) $(x - 8)^2 = 4$

11) _____

    A) $\{6, 10\}$ B) $\{4\}$ C) $\{10\}$ D) $\{-6, -10\}$

Solve the equation by completing the square.

12) $5x^2 + 12x = -3$

    A) $\left\{\dfrac{-12+\sqrt{21}}{5},\ \dfrac{-12-\sqrt{21}}{5}\right\}$

    B) $\left\{\dfrac{-6+\sqrt{51}}{5},\ \dfrac{-6-\sqrt{51}}{5}\right\}$

    C) $\left\{\dfrac{-6+\sqrt{21}}{5},\ \dfrac{-6-\sqrt{21}}{5}\right\}$

    D) $\left\{\dfrac{-6+\sqrt{21}}{10},\ \dfrac{-6-\sqrt{21}}{10}\right\}$

12) _____

Use the quadratic formula to solve the equation.

13) $7x^2 - 3x + 8 = 0$

    A) $\left\{\dfrac{3+\sqrt{215}}{14},\ \dfrac{3-\sqrt{215}}{14}\right\}$

    B) $\left\{\dfrac{3+i\sqrt{215}}{14},\ \dfrac{3-i\sqrt{215}}{14}\right\}$

    C) $\left\{\dfrac{-3+i\sqrt{215}}{14},\ \dfrac{-3-i\sqrt{215}}{14}\right\}$

    D) $\left\{\dfrac{-3+\sqrt{215}}{14},\ \dfrac{-3-\sqrt{215}}{14}\right\}$

13) _____

Identify the vertex of the given parabola.

14) $f(x) = (x + 2)^2 + 4$
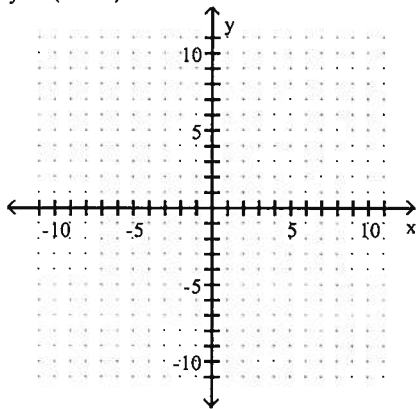
    A) $(4, -4)$ B) $(-4, 2)$ C) $(-2, 4)$ D) $(4, -2)$

14) _____

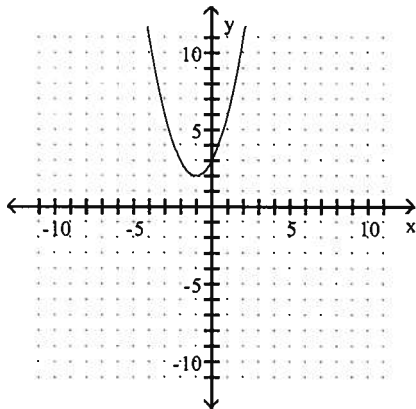**Sketch the graph of the parabola.**
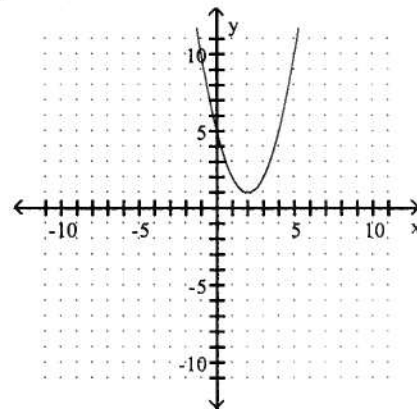
15) $y = (x + 2)^2 + 1$
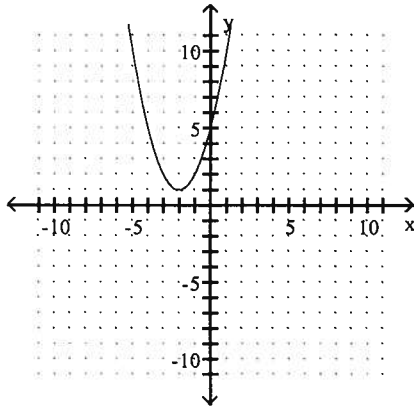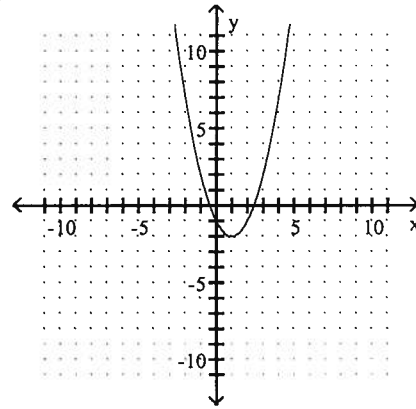
15) _____

A)

B)

B-3

C)

D)

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Solve the equation.

16) $\dfrac{16}{b+2} = 1 + \dfrac{2}{b-4}$

16) _____

Solve the problem. Round your answer to the nearest tenth, if necessary.

17) Two pipes together can fill a large tank in 10 hr. One of the pipes, used alone, takes 15 hr longer than the other to fill the tank. How long would each pipe take to fill the tank alone?

17) _____

18) A jet plane traveling at a constant speed goes 1200 mi with the wind, then turns around and travels for 1000 mi against the wind. If the speed of the wind is a constant 50 mph, and the total flight took 4 hours, find the speed of the plane.

18) _____

Solve the problem.

19) A projectile is thrown upward so that its distance (in feet) above the ground after t seconds is given by $h(t) = -14t^2 + 364t$. What is its maximum height?

19) _____

Solve the equation.

20) $x^4 - 5x^2 - 36 = 0$

20) _____

B-4

Name_____

1) _____
2) _____
3) _____
4) _____
5) _____
6) _____
7) _____
8) _____
9) _____
10) _____
11) _____
12) _____
13) _____
14) _____
15) _____
16) _____
17) _____
18) _____
19) _____
20) _____