

Show all work neatly and systematically for full credit. Total points: 105 (3 points each, unless otherwise stated).

Solve. Write your solution in set builder notation or interval notation.

1) $8x + 2 \geq 4(3x + 1) - 18$

Simplify by factoring.

4) $\sqrt[3]{135}$

Divide and, if possible, simplify. Assume all variables represent positive real numbers.

2)

$$\frac{\sqrt[3]{120x^4y^2}}{\sqrt[3]{15x^2y}}$$

Multiply. Assume that all variables represent nonnegative real numbers.

5) $(3 + \sqrt{5})^2$

Add or subtract. Simplify by combining like radical terms, if possible. Assume all variables and radicands represent nonnegative numbers.

6) $\sqrt{5a} - 5\sqrt{80a} - 3\sqrt{20a}$

Rationalize the denominator. Assume all variables represent positive numbers.

3)

$$\sqrt[3]{\frac{7}{9x}}$$

Simplify.

7) $\sqrt[3]{729x^4y^5}$

Solve the inequality and write the solution in either set builder notation or interval notation.

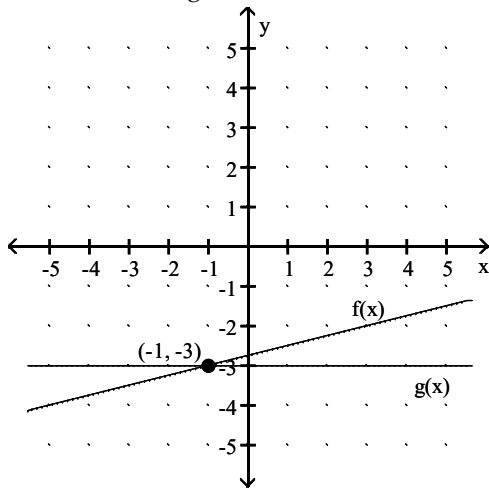
8) $-45 \leq 7x - 10$ and $3x + 6 < 3$

Add or subtract. Simplify by combining like radical terms, if possible. Assume all variables and radicands represent nonnegative numbers.

10) $4\sqrt[3]{27x} + 4\sqrt[3]{64x}$

Solve the inequality using the given graph.

9) Given the graph of f and g, write the solution for the following.



(a). Solve for $f(x) < g(x)$.

(b). Solve $f(x) = g(x)$.

(c). Solve $f(x) > g(x)$.

Multiply. Assume that all variables represent nonnegative real numbers.

11) $\sqrt{5}(\sqrt{3} - \sqrt{7})$

Multiply and simplify. Assume all variables represent nonnegative real numbers. Write your answer in radical notation.

12) $\sqrt[4]{4a^2b}\sqrt{2ab^3c}$

Solve. Write your solution in set builder notation or interval notation.

13) $4x + 7(3x - 3) \leq 9 - 5x$

Multiply. Assume that all variables represent nonnegative real numbers.

$$14) (10\sqrt{2} + 10\sqrt{5})(5\sqrt{2} + 5\sqrt{5})$$

Solve the inequality. Write the solution in either set builder notation or interval notation.

$$17) -5x + 1 \geq 11 \text{ or } 6x + 3 \geq -21$$

Rationalize the denominator. Assume all variables represent positive numbers.

$$15) \frac{\sqrt{3}}{\sqrt{5} + 6}$$

(5) Solve the equation.

$$18) \left| \frac{1}{2}n + 2 \right| = \left| \frac{3}{4}n - 2 \right|$$

Solve the equation.

$$16) 4|6x - 5| - 8 = -6$$

Solve.

$$19) \sqrt[3]{x+5} - 2 = 0$$

Solve the inequality.

- 20) Company A rents copiers for a monthly charge of \$250 plus 10 cents per copy. Company B rents copiers for a monthly charge of \$500 plus 5 cents per copy. What is the number of copies above which Company A's charges are the higher of the two?

Divide and, if possible, simplify. Assume all variables represent positive real numbers.

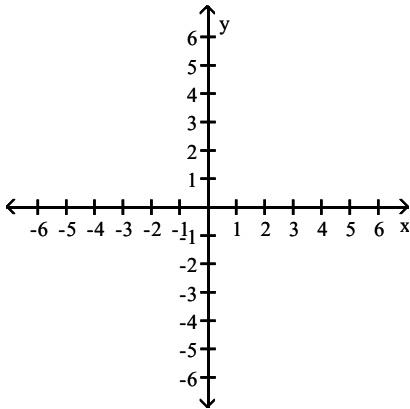
$$22) \frac{\sqrt[4]{x^2y^3}}{\sqrt[3]{xy}}$$

Write the domain of f in interval notation or interval notation.

$$23) \text{ (a). } f(x) = \frac{x+1}{7x-9}$$

Graph the system of linear inequalities.

$$21) x - 2y \leq 2 \text{ and } x + y < 0$$



$$\text{(b). } f(x) = \sqrt{1+7x}$$

Solve the absolute-value inequality. Write the slution in interval notation or set builder notation.

$$24) |b+7| - 6 > 9$$

Solve and write the solution in either set builder notation or interval notation.

25) $|3k + 2| + 9 < 18$

Simplify. Assume that no radicands were formed by raising negative numbers to even powers.

28) $\sqrt[5]{x^{19}y^7z^{12}}$

Solve the equation.

26) $|8m + 3| + 6 = 14$

Simplify by taking the roots of the numerator and the denominator. Assume all variables represent positive numbers.

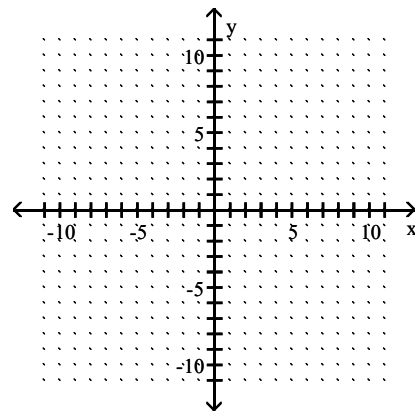
29) $\sqrt{\frac{175a^2b}{c^2}}$

Simplify by taking the roots of the numerator and the denominator. Assume all variables represent positive numbers.

27) $\sqrt[3]{\frac{1296x^4}{6x}}$

Graph on a plane.

30) $5x + y \leq -1$



Multiply and simplify. Assume all variables represent nonnegative real numbers. Write your answer in radical notation.

31) $\sqrt{14m^5}\sqrt{7m^{13}}$

(6) Solve.

34) $\sqrt{3x+1} = 3 + \sqrt{x-4}$

Use rational exponents to simplify. Do not use fraction exponents in the final answer. Assume that even roots are of nonnegative quantities.

32)

$$\sqrt[5]{x\sqrt{3}}$$

Simplify. Assume that variables can represent any value.

33) a. $\sqrt{36x^2}$

b. $\sqrt{25x^2 + 30x + 9}$