

College Algebra Summer Homework

Date _____ Period _____

Pythagorean Theorem.

Draw a right triangle with sides a , b , and hypotenuse c . Use the Pythagorean Theorem to find the missing side of the right triangle with legs a and b and hypotenuse c . Then calculate the perimeter. Approximate values to the nearest tenth when appropriate.

1) $a = 60$ feet, $b = 11$ feet

2) $a = 21$ feet, $b = 11$ yards

3) $a = 5$ centimeters, $c = 13$ centimeters

4) $a = 6$ meters, $c = 15$ meters

5) $b = 7$ millimeters, $c = 10$ millimeters

6) $b = 1.2$ miles, $c = 2$ miles

Properties of Exponents.

Use the quotient rule to simplify the expression. Use positive exponents to write your answer.

7) $\frac{5^4}{5^2}$

8) $\frac{a^{-3}}{a^2 \cdot a}$

9) $\frac{24x^3}{6x}$

10) $\frac{12a^2b^3}{18a^4b^2}$

$$11) \frac{21x^{-3}y^4}{7x^4y^{-2}}$$

Use the power rules to simplify the expression. Use positive exponents to write your answer.

$$12) (5^{-1})^3$$

$$13) (y^4)^{-2}$$

$$14) (4y^2)^3$$

$$15) \left(\frac{4}{x}\right)^3$$

$$16) \left(\frac{2x}{z^4}\right)^{-5}$$

Use the rules of exponents to simplify the expression. Use positive exponents to write your answer.

$$17) \frac{2}{(ab)^{-1}}$$

$$18) \frac{2^{-3}}{2t^{-2}}$$

$$19) \frac{6a^2b^{-3}}{4ab^{-2}}$$

$$20) \frac{5r^{2s}t^{-3}}{25rs^{-2}t^2}$$

$$21) (3x^2y^{-3})^{-2}$$

$$22) \frac{(d^3)^{-2}}{(d^{-2})^3}$$

$$23) \left(\frac{3t^2}{2t^{-1}}\right)^3$$

$$24) \left(-\frac{2t}{4t^{-2}}\right)^{-1}$$

$$25) \frac{(-m^2n^{-1})^{-2}}{(mn)^{-1}}$$

$$26) \left(\frac{2a^3}{6b}\right)^4$$

$$27) \frac{8x^{-3}y^{-2}}{4x^{-2}y^{-4}}$$

$$28) \frac{(r^2t^2)^{-2}}{(r^3 \cdot t)^{-1}}$$

$$29) \frac{4x^{-2}y^3}{(2x^{-1} \cdot y)^2}$$

$$30) \left(\frac{4 \cdot (xy)^2}{(2xy^{-2})^3} \right)^{-2}$$

General Factoring

Factor the expression completely.

$$31) 16x^2 - 25$$

$$32) 25x^2 - 30x + 9$$

33) $x^2 + 16x + 64$

34) $12x^2 + x - 6$

35) $5x^2 - 38x - 16$

36) $2x^3 - 12x^2 + 18x$

37) $3x^2 - 5x - 8$

38) $15x^2 - 11x + 2$

39) $7a^3 + 20a^2 - 3a$

40) $b^3 - b^2 - 2b$

41) $10x^3 + 28x^2 - 6x$

42) $2x^4 - 5x^3 - 25x^2$

Rational Exponents

Write the expression in radical notation. Then evaluate the expression when the result is an integer.

43) $8^{-\frac{1}{3}}$

44) $8^{\frac{4}{3}}$

45) $(-1)^{\frac{4}{3}}$

46) $81^{\frac{3}{4}}$

$$47) 13^{-\frac{3}{5}}$$

$$48) 16^{-\frac{3}{4}}$$

$$49) 23^{-\frac{1}{2}}$$

Radical Expressions

Simplify the expression. Assume that all variables are positive.

$$50) \sqrt[3]{-8y^3}$$

$$51) \sqrt{2} \cdot \sqrt{18}$$

$$52) \frac{\sqrt{7}}{\sqrt{28}}$$

$$53) \sqrt[3]{8xy^3}$$

$$54) \frac{\sqrt{4xy^2}}{\sqrt{x}}$$

Simplify the expression. Assume all variables are positive.

$$55) 2\sqrt{3} + 7\sqrt{3}$$

$$56) 18\sqrt[3]{3} + 3\sqrt[3]{3}$$

$$57) 8\sqrt{7} + 2\sqrt{7}$$

Simplify the expression. Assume that all variables are positive and write your answer in radical notation.

$$58) \sqrt{5} \cdot \sqrt[3]{5}$$

$$59) \sqrt{3} \cdot \sqrt[3]{3}$$

$$60) \sqrt[4]{8} \cdot \sqrt[3]{4}$$

Simplify the radical expressions by factoring out the largest perfect nth power. Assume that all variables are positive.

61) $\sqrt[3]{-125x^4y^5}$

62) $\sqrt[3]{81}$

Multiply and simplify.

63) $(3 + \sqrt{7})(3 - \sqrt{7})$

64) $(\sqrt{x} + 8)(\sqrt{x} - 8)$

Rationalize the denominator.

65) $\frac{4}{\sqrt{3}}$

66) $\frac{\sqrt{2}}{\sqrt{5} + 2}$