Worksheet-7

MTH-05:Elementary Algebra (Roots & Radicals)

First Name: .....

Last Name: .....

1) Simplify the following expression: $\left(-\sqrt{11}\right)^2$

a) - 11

b) 121

c) $\sqrt{11}$

d) 11

2) Tell whether the following number is rational, irrational or not a real number : $\sqrt{-27}$

a) Rational

b) Irrational

c) Not a real number

3) Find the third side of a right triangle with sides a, b and c, where c is the hypotenuse and a = 5, c = 8.

a) 3

b) $\sqrt{89}$

c) $\sqrt{39}$

d) 11

4) A right triangle has legs which measure 7 feet and 24 feet Find the measure of the hypotenuse.

a) 17 ft

b) 23 ft

c) 25 ft

d) 31 ft

5) Use the product rule for radicals to find the following product.

$\sqrt{13} \cdot \sqrt{x}$

a) $\sqrt{13x}$

b) 13

c) 13x

d) $\sqrt{13}x$

6) Simplify completely : $\sqrt{162}$

a) $4\sqrt{3}$

b) $8\sqrt{2}$

c) $9\sqrt{3}$

d) $9\sqrt{2}$

7) **Use the product rule for radicals to find the product : $\sqrt{9} \cdot \sqrt{8}$ Simplify as far as you can.**

a) 17

b) 72

c) $3\sqrt{8}$

d) $6\sqrt{2}$

8) **Simplify : $\sqrt{3} \cdot \sqrt{7} + 2\sqrt{21}$**

a) $3\sqrt{21}$

b) $(2 + \sqrt{3})\sqrt{147}$

c) $2\sqrt{21}$

d) $\sqrt{6} + \sqrt{147}$

9) **Perform the indicated operation.**

$\sqrt[4]{7} - 5\sqrt[4]{7}$

a) $5\sqrt[4]{7}$

b) $-4\sqrt[4]{7}$

c) $-5\sqrt[4]{7}$

d) $4\sqrt[4]{7}$

10) **Simplify : $(3\sqrt{5} - 2)(2\sqrt{5} + 7)$**

a) $23\sqrt{5} - 14$

b) $30 + 17\sqrt{5}$

c) $54 + 17\sqrt{5}$

d) $16 + 17\sqrt{5}$

11) **Simplify : $(6\sqrt{2} - \sqrt{3})(6\sqrt{2} + \sqrt{3})$**

a) 75

b) $36\sqrt{2} - 3$

c) 63

d) 69

12) **Simplify the following expression.**

$5\sqrt{15} + \sqrt{60}$

a) $3\sqrt{15}$

b) $5\sqrt{15}$

c) $6\sqrt{15}$

d) $7\sqrt{15}$

13) Simplify the following expression.

$\sqrt[3]{81} - 9\sqrt[3]{24}$

a) $-5\sqrt[3]{3}$

b) $15\sqrt{3}$

c) $-15\sqrt{3}$

d) $-15\sqrt[3]{3}$

14) Simplify the following expression.

$\sqrt{81} + \sqrt{9}$

a) 9

b) 12

c) 6

d) 27

15) Simplify and write with no radical in the denominator : $\sqrt{\frac{7}{11}}$

a) $\frac{\sqrt{77}}{11}$

b) $\frac{\sqrt{7}}{11}$

c) $\frac{7}{11}$

d) $\frac{49}{121}$

16) Rationalize the denominator:

$\frac{5\sqrt{15}}{\sqrt{6}}$

a) $\frac{5\sqrt{10}}{2}$

b) $\frac{5\sqrt{15}}{6}$

c) $\frac{\sqrt{15}}{6}$

d) $\frac{5\sqrt{15}}{2}$

17) **Simplify $\sqrt{\frac{35}{3}}$ by rationalizing the denominator.**

a) $\frac{\sqrt{105}}{3}$

b) $\frac{\sqrt{35}}{3}$

c) $\frac{\sqrt{35}}{\sqrt{3}}$

d) can't be simplified

18) **Simplify the following expression.**

$\sqrt{\frac{12}{5}}$

a) $\frac{2\sqrt{3}}{5}$

b) $\frac{2\sqrt{3}}{1}$

c) $\frac{2\sqrt{15}}{5}$

d) $\frac{2\sqrt{30}}{5}$

19) **Find the conjugate of** $3\sqrt{2} + \sqrt{6}$

a) $-3\sqrt{2} - \sqrt{6}$

b) $3\sqrt{6} - \sqrt{2}$

c) $-3\sqrt{2} + \sqrt{6}$

d) $3\sqrt{2} - \sqrt{6}$

20) **Rationalize the denominator**

$\frac{2 - \sqrt{3}}{5 - \sqrt{2}}$

a) $\frac{10 - 2\sqrt{2} - 5\sqrt{3} + \sqrt{6}}{23}$

b) $\frac{10 + 2\sqrt{2} - 5\sqrt{3} - \sqrt{6}}{23}$

c) $\frac{10 - 2\sqrt{2} - 5\sqrt{3} + \sqrt{6}}{-23}$

d) $\frac{10 + 2\sqrt{2} - 5\sqrt{3} - \sqrt{6}}{-23}$

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Answer Keys

1) d)11

2) c)Not a real number

3) c)$\sqrt{39}$

4) c)25 ft

5) a)$\sqrt{13x}$

6) d)$9\sqrt{2}$

7) d)$6\sqrt{2}$

8) a)$3\sqrt{21}$

9) b) $-4\sqrt[4]{7}$

10) d)$16 + 17\sqrt{5}$

11) d)69

12) d)$7\sqrt{15}$

13) d) $-15\sqrt[3]{3}$

14) b)12

15) a)$\frac{\sqrt{77}}{11}$

16) a)$\frac{5\sqrt{10}}{2}$

17) a)$\frac{\sqrt{105}}{3}$

18) c)$\frac{2\sqrt{15}}{5}$

19) d)$3\sqrt{2} - \sqrt{6}$

20) b)$\frac{10 + 2\sqrt{2} - 5\sqrt{3} - \sqrt{6}}{23}$