MATH 7 HOMEWORK 2: POWERS AND EXPONENTS SEP 23, 2018

Radicals

$$a^{\frac{m}{n}} = \sqrt[n]{a^m}, n \neq 0$$
$$\sqrt{ab} = \sqrt{a}\sqrt{b}$$

Algebraic Identities

 $(a+b)^{2} = a^{2} + 2ab + b^{2}$ $(a-b)^{2} = a^{2} - 2ab + b^{2}$ $a^{2} - b^{2} = (a-b)(a+b)$

Scientific Notation

A number is written in standard form or scientific notation if it has the form $\mathbf{N} \times \mathbf{10^n}$, where $1 \leq N < 10$ and n is an integer. For example 0.00023 is 2.3×10^{-4} in scientific notation.

Homework

- 1. Write down all the squares for numbers 1 to 20.
- **2.** Evaluate:
 - (a) $81^{\frac{1}{2}} =$ (b) $\sqrt{144} =$ (c) $\sqrt{4^2 \times 9^2} =$ (d) $\sqrt{2^3 \times 3^4} =$
- **3.** Evaluate:

(a)
$$\frac{10^{-3}}{5^{-3}} =$$

(b) $\frac{3^2 \times 6^{-3}}{10^{-3} \times 5^2} =$

4. Simplify:

(a)
$$(3^{-4})^2 =$$

(b) $(3^4 \times 3^0)^3 =$
(c) $(2^{-3} \times 2^7)^2 =$
(d) $(5^8 \times 5^{-4})^{-3} =$
(e) $\frac{7^{-2} \times 7^8}{7^{12}} =$

(f)
$$\frac{5^5}{3^8 \times 5^3 \times 3^{-7}} =$$

5. Evaluate $\frac{5^{-1}}{3} \times \left(\frac{8}{15}\right)^{-4} \times \left(\frac{15}{16}\right)^{-3} =$
6. Simplify:

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(a)
$$\frac{a^3}{a^2} =$$

(b) $\frac{(-x)^5}{(-x)^3} =$
(c) $(a^2b^3)(b^4a^3) =$
(d) $(r^{-5}s^{-2})(s^5r^{-2}) =$
(e) $(t^4u^{-8})(u^5t^0)(t^{-5}u^0) =$

- 7. Express in ordinary notation: 6.01×10^3 , 0.021×10^{-4}
- 8. Rewrite in scientific notation: 1234.1, 0.0012, 3400000 (correct to 3 significant digits), 42.36×10^{-3}
- **9.** Factor:
 - (a) $25a^2 9b^2 =$ (b) $(x+1)^2 - 4 =$ (c) $(3+x)^2 + 2(3+x) + 1 =$ (d) $a^2 + bc + ab + ac =$ (e) $(a-1)^2 - (a+1)^2 =$ (f) $1 + 30a + 225a^2 =$

- 10. Simplify (a) $\frac{2}{x-1} + \frac{3}{x-2} =$ (b) $x \frac{xy}{y-x} =$ (c) $\frac{a}{a-b} + \frac{a}{b-a} =$
- 11. Jasmine can do a certain job in 3 hours, Alex can do this same job in 2 hours. How long would it take both of them if they work together?
- **12.** A bathtub can be filled in 3 minutes, and emptied in 4 minutes. If both the faucet and the drain are open, how long does it take to fill the tub?
- 13. The smallest circle has a radius of 2. Each successive circle has a radius of 2 more than the previous. Approximately what percent of the design is black?

