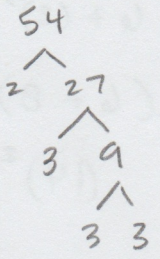
Key

Pre-Algebra Chapter 4 Pre-Test

1.) (5 pts each, 10 pts total) (4-1) Use divisibility rules to create a prime factorization tree for each of the following numbers.

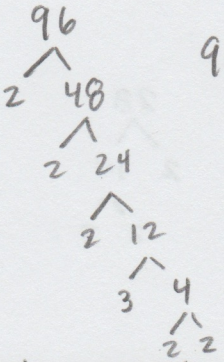
a) 54



$54: 3 \cdot 3 \cdot 3 \cdot 2$

$3^3 \cdot 2$

b) 96



$96: 3 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot$

$3 \cdot 2^5$

2.) (5 pts each, 10 pts total) (4-2) Write using exponents

a) $2 \cdot 2 \cdot 2 \cdot 3 \cdot 3 \cdot a \cdot a \cdot a \cdot a \cdot b \cdot c \cdot c \cdot c$

$2^3 3^2 a^4 b c^3$

b) $5 \cdot 5 \cdot x \cdot x \cdot y \cdot y \cdot y \cdot y \cdot y \cdot y$

$5^2 x^2 y^6$

3.) (5 pts total) (4-2) Evaluate.

$(6 + h^3)^2$ for h = 2

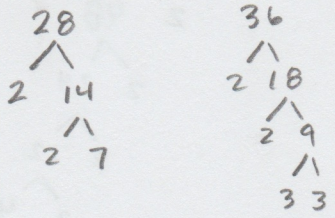
$(6 + (2)^3)^2$

$(6 + 8)^2$

$(14)^2 = 14 \cdot 14 = 196$

4.) (5 pts each, 15 pts total) (4-3) Find the Great Common Factor (GCF) for each of the following.

a) 28 and 36

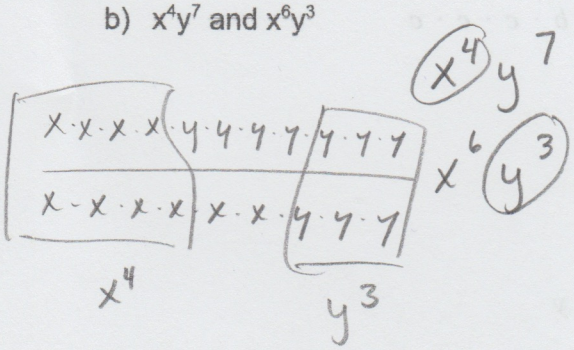


28: 7 · 2 · 2

36: 3 · 3 · 2 · 2

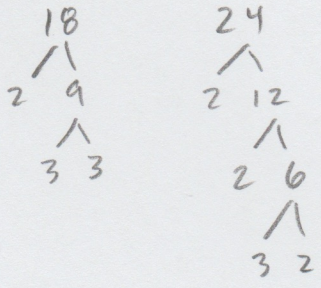
GCF: 2 · 2 = 4

b) x^4y^7 and x^6y^3



x^4y^3

c) $18a^3b^2$ and $24a^2bc$



$18a^3b^2$: 3 · 3 · 2 · a · a · a · b · b

$24a^2bc$: 3 · 2 · 2 · 2 · a · a · b · c

GCF: 3 · 2 · a · a · b

$6a^2b$

5.) (5 pts each, 15 pts total) (4-4) Write in simplest form.

a) $\frac{21}{28}$

21 → 3 · 7

28 → 2 · 14 → 2 · 7

$\frac{21}{28} = \frac{7 \cdot 3}{7 \cdot 2 \cdot 2} = \frac{3}{4}$

b) $\frac{9h^5k}{12h^4k^3}$

$\frac{9h^5k}{12h^4k^3} = \frac{3 \cdot 3 \cdot h \cdot h \cdot h \cdot h \cdot h \cdot k}{3 \cdot 2 \cdot 2 \cdot h \cdot h \cdot h \cdot h \cdot k \cdot k \cdot k} = \frac{3h}{4k^2}$

9 → 3 · 3

12 → 3 · 4 → 2 · 2

c) $\frac{42a^8b^6}{56a^3b^{11}}$

$\frac{42a^8b^6}{56a^3b^{11}} = \frac{7 \cdot 3 \cdot 2 \cdot a^8b^6}{7 \cdot 2 \cdot 2 \cdot 2 \cdot a^3b^{11}}$

56 → 2 · 28 → 2 · 14 → 2 · 7

42 → 2 · 21 → 3 · 7

$\frac{3a^5}{4b^5}$

$\frac{a^8}{a^3} = a^{8-3} = a^5$

$\frac{b^6}{b^{11}} = \frac{1}{b^5}$

6.) (5 pts each, 15 pts total) Evaluate. Write in simplest form.

a) $\frac{x}{y}$ for x = 12 and y = 21

$\frac{12 \div 3}{21 \div 3} = \frac{4}{7}$

b) $\frac{z+2}{z^2-4}$ z = 6

$\frac{6+2}{(6)^2-4} = \frac{8}{36-4} = \frac{8 \div 8}{32 \div 8} = \frac{1}{4}$

c) $\frac{y^3-4y+6}{y^3}$ for y = -2

$\frac{(-2)^3-4(-2)+6}{(-2)^3} = \frac{-8+8+6}{-8} = \frac{6}{-8} = -\frac{3}{4}$

7.) (5 pts each, 15 pts total) (4-8) Simplify each expression.

a) $\frac{8^6}{8^3} = 8^{6-3} = 8^3$

b) $(-5)^0 = 1$

c) $n^{-4} = \frac{1}{n^4}$

8.) (5 pts each, 10 pts total) (4-9) Write each of the following in scientific notation.

a) 7630000

7630000.
6 5 4 3 2 1

$7.63 * 10^6$

b) 0.000624

0.000624
1 2 3 4

$6.24 * 10^{-4}$

9.) (5 pts total) (4-9) Multiply. Write your result in scientific notation.

$$(2 \times 10^5) \times (4 \times 10^3)$$

$2 * 4 * 10^5 * 10^3$

$8 * 10^{5+3}$

$\boxed{8 * 10^8}$