Math 5B: Classwork 27
Homework #27 is due May 10-th.

REVIEW

May 3, 2020

- ***Binary numbers. Powers of 2:***

n	0	1	2	3	4	5	6	7	8	9
$\mathbf{2^n}$	1	2	4	8	16	32	64	128	256	516

Numbers in decimal notation can be presented like this

$351 = 1\cdot 2^8 + 0\cdot 2^7 + 1\cdot 2^6 + 0\cdot 2^5 + 1\cdot 2^4 + 1\cdot 2^3 + 1\cdot 2^2 + 1\cdot 2^1 + 1\cdot 2^0 = 101011111b$

Recall: Square root of a (denoted $\sqrt{a}$ is a number whose square is equal to a. For example: square root of 25 is 5, because $5^2 = 25$.
We discussed that

$$\boldsymbol{\sqrt{ab} = \sqrt{a}\cdot\sqrt{b}}$$

$$\boldsymbol{\sqrt{a+b} \neq \sqrt{a} + \sqrt{b}}$$

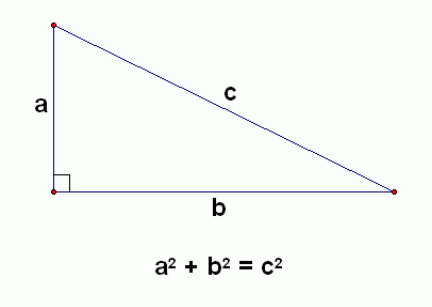
$$\sqrt{a^2} = a$$

$$\sqrt{8} = \sqrt{4\cdot 2} = \sqrt{4}\cdot\sqrt{2} = \sqrt{2^2}\cdot\sqrt{8} = 2\cdot\sqrt{2}$$

$$\sqrt{a^8} = \sqrt{(a^4)^2} = a^4$$

Square roots naturally appear in geometry:
Pythagorean Theorem: In a right triangle with legs a, b and hypotenuse c, one has

$$\boldsymbol{a^2 + b^2 = c^2} \quad \textbf{or} \quad \boldsymbol{c = \sqrt{a^2 + b^2}}$$



Review Exponents Properties/Rules:

1. $a^0 = 1$

2. $a^m \cdot a^n = a^{m+n}$
3. $a^m \div a^n = \frac{a^m}{a^n} = a^{m-n}$
4. $(ab)^n = a^n \cdot b^n$
5. $\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}$
6. $a^n = \frac{1}{a^{-n}}$
7. $(a^m)^n = a^{m \cdot n}$

Proportions

To make 13 cookies you need 2 cups of flour. How much flour you need to make 20 cookies?

13 cookies – 2 cups 20 cookies – x cups	$\frac{13}{20} = \frac{2}{x}$ $13x = 2 \cdot 20$

Classwork 25: REVIEW

1. Binary numbers:
   a. Write as binaries: 35, 11, 40
   b. Write as Decimals: 101010b, 11100011b

2. Solve equations:

   a) $\frac{3}{8}x = \frac{1}{3}$ b) $|2x - 5| = 1$ c) $\frac{x-2}{x-1} = 3$

3. Simplify:

   $\frac{6^5 \cdot 2^4}{3^5 \cdot 2^2} =$ $\frac{42^2}{6^2} =$ $\frac{9^2 \cdot 2^4}{6^2} =$ $\sqrt{\frac{4^2}{5^{10}}} =$ $\sqrt{12} =$

4. A piece of cable 8.5 cm long weighs 52 grams. What will a 10-cm length of the same cable weigh?

5. Find a simple fraction form for the following repeating decimals:

   a) $0.\overline{73}$ b) $0.\overline{81}$

6. The standard card deck has 4 suits (hearts, diamonds, spades, and clubs); each suit has 13 different card values: 2 through 10, jack, queen, king, and ace. If you randomly draw one card, what is the probability of getting

(a) The queen of spades
(b) A face card (i.e., jack, queen, or king)
(c) Anything but the queen of hearts

7. Open parenthesis, simplify:

(a) $3(a-5)-2(2a-9)=$ (b) $12x-3x(x+4)=$

(c) $5x-5(7-a+x)=$ (d) $-3z-(z-4)+2(2z-5)=$

(e) $a(a+b)+b(a+1)=$ (f) $2a(a-2)-a(a-1)=$

Open parenthesis, simplify.

$(2x-3)^2=$ $(4x-5)(4x+5)=$

Homework 25: REVIEW

1. Simplify:

(a) $\left(\frac{5a^2b^5}{4a^3b^3}\right)^3=$ (b) $\left(2z^2\cdot 3z^3\cdot z\right)^2=$ (c) $\frac{(-ab)^8}{(ab)^2}=$

(d) $\left(\frac{3ab^3}{15b}\right)^2\cdot\frac{75c}{a^2b^6}=$ (d) $\left(\frac{3a^5b^2}{21ab}\right)^2\cdot\frac{7^4}{a^{16}b^2}=$

2. Solve equations:

a) $7x=2$ b) $12x=6$ c) $7x=14$ d) $21x=7$

e) $\frac{3}{8}x=\frac{1}{3}$ f) $\frac{11}{113}x=\frac{121}{3}$ g) $\frac{3}{4}(x+8)=10$ h) $\frac{1}{2}(x+1)=x-3$

i) $\frac{1}{2}x+\frac{1}{3}x=x-\frac{1}{12}$ j) $\frac{3x+2a}{2a-5x}=-1$

3. Open parenthesis, simplify:

$3a(b+ac)-c(3a^2-2)+2ab=$

$2a(2a-3)-3(2a+3)=$

$(2a-3)(2a+3)=$

4. Find legs....

Find the length of legs, if hypotenuse is 10?