AP Computer Science A

Mr. Henderson

1. Log in
2. Open Netbeans and Moodle
3. Did you finish Unit 1 WS 01?
4. Did you enter your answers online?

Sep 28-7:21 AM

Quick Review ... simple math ...

\+ //easy stuff

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Sep 28-9:28 AM

Do you remember modulus?

10%8 = 2 //remainder when 10/8

In mathematics this is called modulus arithmetic and would be written 10 mod 8

```
System.out.println(9%2);
System.out.println(15%4);
System.out.println(12%6);
```

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Order of Operations!!!

PEMDAS

Parenthesis	( )
Exponents	Powers
Multiplication & Division (mod)	x / %
Addition & Subtraction	+ -

Example: 15 - 20 % 7 - 2 * 3 = 3 //see it?

Sep 28-9:28 AM

Review - Compound Operators

+= -= *= /=

Remember that x+=1 is the same as: x = x + 1
or : x++

```
int a=20, b=3;
a+=5;
a+=b;
System.out.print(a);
```

output: 28

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More difficult examples ...

```
int c=10, d=7;
c*=d;
d+=2*c;
int theAnswer= c+d;
System.out.print(theAnswer);
```

output: 217

```
int m=4, p=10;
p/=m;
System.out.print(p);
m = (double)m/p;
System.out.print(m);
```

output: 2

error!
would have been: 22

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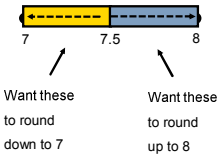
Rounding to the nearest (positive) integer ...

(int)(double + 0.5)

Here's what's happening ...



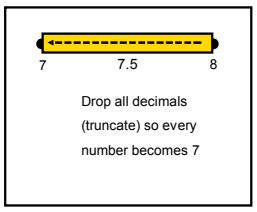
Oct 1-10:53 AM

Rounding to the nearest (positive) integer ...

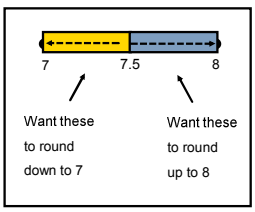
(int)(number)

Doesn't quite do what I want ...

Does This ...



Want This ...



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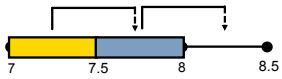
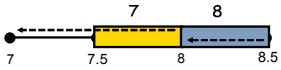
Rounding to the nearest integer ...

(int)(number + 0.5)

I want to shift the regions 0.5, then (int) ...





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The official way to round a number ...

(int)(doubleNumber + 0.5);

Think about it ...

(int)(3.478 + 0.5);

(int)(12.8 + 0.5);

(int)(7.1 + 0.5);

(int)(1.9 + 0.5);

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Application of rounding ...

Say we spend $15.23 but have to pay 6.875% sales tax (MN).

$15.23 x 1.06875 = $16.2770625

double x double = double ... but let's "drop" extra $ (no rounding!)

```
double cost=15.23, taxRate=0.06875;
double totalCost = cost*(1+taxRate);    //calculate cost
totalCost = (int)(100*totalCost);       //drop after 2 decimals
totalCost /=100;                        //return back
System.out.print(totalCost);            //print it!
```

Oct 1-11:28 AM

But shouldn't tax round up???

Say we spend $15.23 but have to pay 6.875% sales tax (MN).

$15.23 x 1.06875 = $16.2770625

double x double = double ... but let's "drop" extra $ (no rounding!)

```
double cost=15.23, taxRate=0.06875;
double totalCost = cost*(1+taxRate);    //calculate cost
totalCost = (int)(100*totalCost+0.5);   //drop after 2 decimals
totalCost /=100;                        //return back
System.out.print(totalCost);            //print it!
```

*** Added 0.5 before (int) to make 1628 instead of 1627 ***

Oct 1-11:28 AM

Round to 1 decimal?...

```
number          // 8.37
10 * number     // 83.7
add 0.5         // 84.2
(int)           // 84      (int)(10*number+0.5)
divide by 10    // 8.4
```

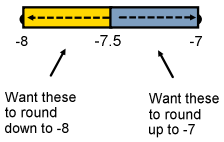
Round to 2 decimals?..

```
number          // 2.3592
100 * number    // 235.92
add 0.5         // 236.42
(int)           // 236     (int)(100*number+0.5)
divide by 100   // 2.36
```

Oct 1-11:36 AM

What if we want to round a negative??

Here's what we want ...



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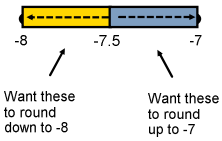
Before we shifted right ...
Now we are shifting left ...



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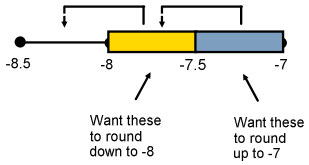
We shift left by SUBTRACTING 0.5 ...
(number - 0.5)



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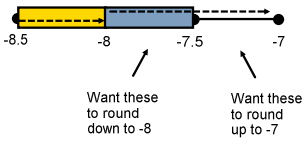
Casting as integer drops the decimal!
(int)(number - 0.5)



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Checklist for today ...

- ☐ Understand today's lesson
- ☐ Complete Unit 1 Worksheet 02
- ☐ Enter Worksheet Answers in Moodle (counts as a grade, retake once)

Sep 28-9:44 AM