MrF

GRADE 10 ESSENTIAL REFERENCE NOTES (SKELETON)

This is ***my*** teacher version of Grade 10 Essential Reference Notes. You will want to definitely *prepare your own*! I **do not explain** these notes!
They are **mine**. Use them at your **own risk**!

Unit A – GAMES AND NUMBERS (PROBLEM SOLVING)

To solve many 'math' problems (and those of life too), try a few of these

List (and Count), **Draw** a Diagram, **Guess** and Check, **Model** the problem, Use a **Table**, See if you are missing any information, Solve a **simpler** version, Look for a **Pattern,** use **Logic**

THINK! Explore

UNIT B – PERSONAL FINANCE

GROSS Income: All Income. **Bi-Weekly** ≡ every two weeks

NET INCOME: Income after **deductions**

NET = **GROSS –** (**Income Taxes + CPP contributions + EI Contributions + Other Deductions**)

To calculate income taxes:

Taxable income = Gross – (Company Pension Contribution + RRSP Contribution + Union Dues Paid)

Income tax(es) = tax rate(s) * **Taxable income**

UNIT C – MEASUREMENT (See conversion tables)

Mega ≡ 1,000, 000; Kilo ≡ 1,000; Centi ≡ $^1/_{100}\,th$; Milli ≡ $^1/_{1,000}\,th$

Should be familiar with *many* of these conversions (memorize)		
Metric ↔ Metric	**'Old' System**	**Metric ↔ Old System**
1 **k**ilometre [km] = **1,000** m	1 ft = 12 in	1 in ≅ **2.5**4 cm
1 metre [m] = 100 cm	1 yd = 3 feet = 36 in	1 m ≅ 3.28 ft
1 **centi**meter = **1/100**th metre	1 mi = 5280 ft = 1760 yd	1 kg ≅ **2.2**05 lb
1 centimetre [cm] = 10 mm	1 pound [lb] = 16 onces [oz]	1 mi ≅ **1.6**09 km
1 kg = 1,000 g	1 ton = 2,000 lb	1 Imp Gallon ≅ 4.55 L
1 gram [g] = **1,000 milli**gram [mg]	1 quart [qt] = 2 pints [pt]	1 US Gallon ≅ 3.79 L
1 L = 1,000 mL 1 kL = 1,000 L	4 quarts = 1 gallon [gal]	$\mathcal{F} = \left(^9/_5\right)\mathcal{C} + 32$ $\mathcal{C} = {}^5/_9 * (\mathcal{F} - 32)$

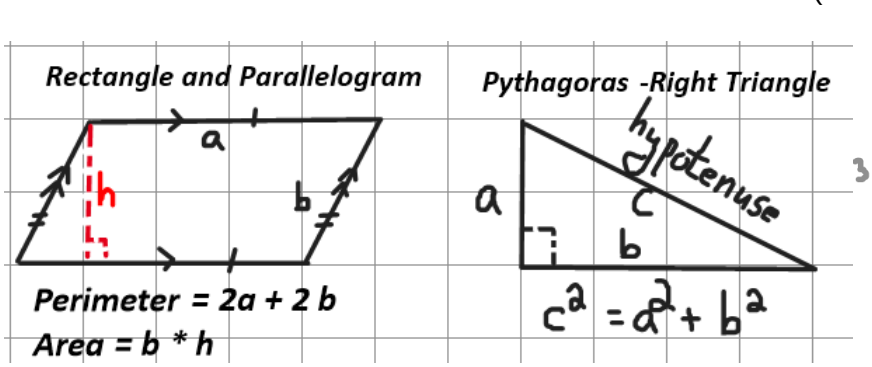
Unit D: Two-Dimensional Geometry

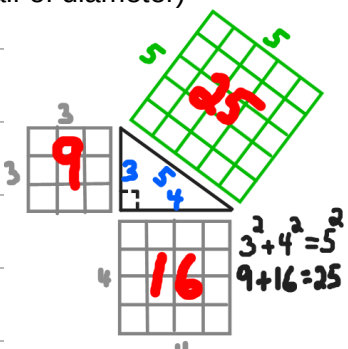
Selected Formulae (See also separate full formulae sheet)

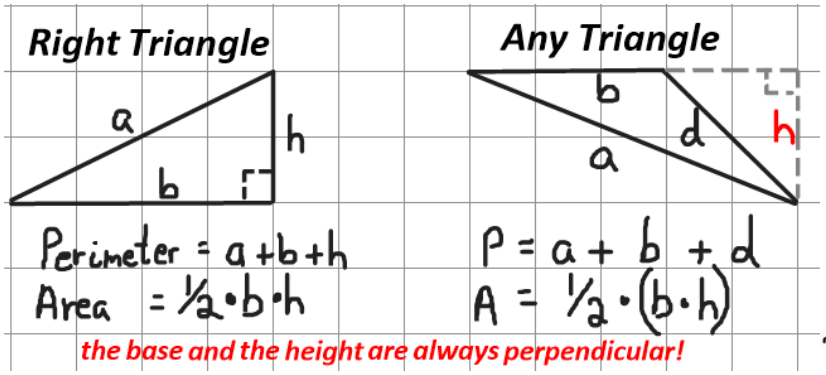
Perimeter ≡ distance around a shape; **Area** ≡ amount of squares inside surface of shape

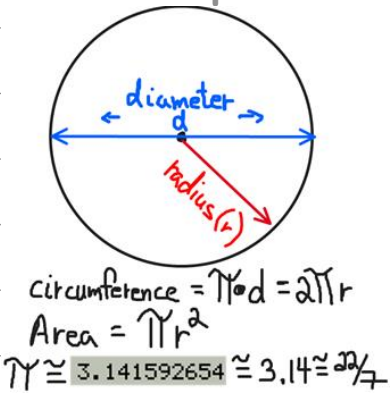
circumference ≡ Distance around a circle; **diameter** ≡ dist across circle;

radius ≡ distance from centre to circumference (half of diameter)









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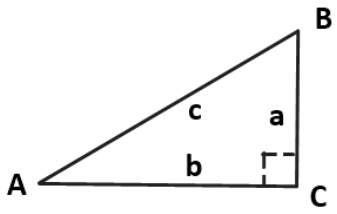
Unit E – Trigonometry

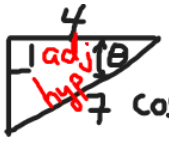
SOH CAH TOA. $sinA = \frac{side\ opp\ to\ \angle A}{hypotenuse}$; $cosA = \frac{side\ adjacent\ to\ \angle A}{hypotenuse}$; $tanA = \frac{side\ opp\ to\ \angle A}{ide\ adj\ to\ \angle A}$



$\sin A = \frac{a}{c}$ $\sin B = \frac{b}{c}$

$\cos A = \frac{b}{c}$ $\cos B = \frac{a}{c}$

$\tan A = \frac{a}{b}$ $\tan B = \frac{b}{a}$



$\cos\theta = \frac{Adj}{Hyp}$

$\cos\theta = \frac{4}{7} \approx 0.5714$

$\theta = \cos^{-1}\left(\frac{4}{7}\right) \approx 55°$

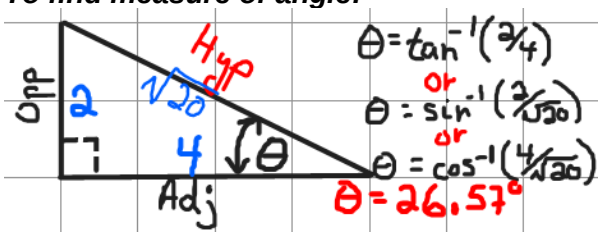
Hypotenuse side is always across from the 90° corner.

If know two parts of a right triangle, can figure out the rest.

***Handy rule**: longest side across from biggest angle, smallest side across from smallest angle.*

***Round** trig ratios to nearest 0.0001 normally*

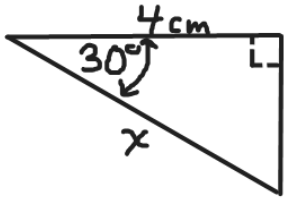
To find measure of angle:



$\theta = \tan^{-1}\left(\frac{2}{4}\right)$ or $\theta = \sin^{-1}\left(\frac{2}{\sqrt{20}}\right)$ or $\theta = \cos^{-1}\left(\frac{4}{\sqrt{20}}\right)$

$\theta = 26.57°$

To find a side:



$\cos 30° = \frac{4}{x}$

$\cos 30° = \frac{4}{x}$

$x = \frac{4}{\cos 30°}$

$x = 4.62\text{cm}$

Unit F – Consumer Decisions

Unit Cost. The cost (**$**) per unit amount (**L**itres, or **g**rams, etc)

Examples: 4.5 L cleanser for $8.00. $8.00 / 4.5L = **$***1.78* / **L**

12 cans of 355 ml pop for $6.50: $\$6.50 \cdot \frac{1\text{can}}{355\text{ml}} \cdot \frac{1000\text{ml}}{1\text{L}} = \$1.53/\text{L}$

Money Exchange. Same as any conversion **except** depends on whether you are buying or selling the currency.

Example. Given USD Exchange rates: **Bank Sells to you**: 1.30 $CDN = 1 $USD

Bank Buys from you: 1.20 Cdn = 1$USD

Convert $50Cdn to USD to go shopping in US.

$\$50\text{Cdn} \cdot \frac{1\text{USD}}{1.30\text{Cdn}} = \$38.46\text{USD}$

Convert $350USD back to $Cdn

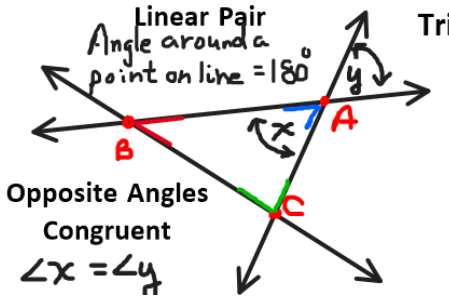
$\$350\text{US} \cdot \frac{1.20\text{Cdn}}{1\text{USD}} = \$420\text{Cdn}$

Unit G – Transformations

(*x*, *y*) ordered pair Cartesian grid coordinates**.** **(*x*:** left and right**; *y*:** up and down)

Translate: to slide. **Reflection**: across a line or a grid axis. **90° Rotation**: *x*→*y*; *y*→*x*

Unit H – Angle Construction



Triangle Sum

$\angle BAC + \angle ABC + \angle ACB = 180°$

Unit X – Prior Studies

Your Unit X studies should have refreshed your **Multiplication Tables**, your **Fractions**, **proportions**, etc.

You know how to **estimate** calculations, **round** decimal numbers, **convert** from decimal to percent to fraction and **place values**

You know basic **shapes** and **geometry** rules

You know how to use a decent **scientific calculator**: exponents, fractions, trigonometry, etc.

Knowing your **multiplication tables** is critical to making math so much easier.