**Lines and Coordinate Geometry**

***Distance:*** $d=\sqrt{\left(x\_{2}-x\_{1}\right)^{2}+\left(y\_{2}-y\_{1}\right)^{2}}$

***Midpoint:*** $\left(\frac{\left(x\_{2}+x\_{1}\right)}{2}, \frac{\left(y\_{2}+y\_{1}\right)}{2}\right)$

Given any two points, $\left(x\_{1},y\_{1}\right), \left(x\_{2},y\_{2}\right)$

***Slope:*** $m=\frac{\left(y\_{2}-y\_{1}\right)}{\left(x\_{2}-x\_{1}\right)}$

*a*

*b*

*x*

Geometric Mean

**Triangles**

***Geometric Mean:*** $\frac{a}{x}=\frac{x}{b}$

***Law of Sines:*** $\frac{a}{\sin(A)}=\frac{b}{\sin(B)}=\frac{c}{\sin(C)}$

***Law of Cosines:*** $a^{2}=b^{2}+c^{2}-2bc\cos(A)$

Law of Sines/Cosines

 $b^{2}=a^{2}+c^{2}-2ac\cos(B)$

*C*

*b*

*a*

 $c^{2}=a^{2}+b^{2}-2ab\cos(C)$

*B*

*A*

*c*

**Polygons**

Sum of Interior Angles: $\left(n-2\right)180$

One Interior Angle: $\frac{\left(n-2\right)180}{n}$

One Exterior OR Central Angle: $\frac{360}{n}$

**Circles (more on back)**

***Equation of a Circle:*** $\left(x-h\right)^{2}+\left(y-k\right)^{2}=r^{2}$

 With center (*h*, *k*) and radius *r*

***Length of Arc:*** $\frac{n}{360}$ $∙2πr$

Where *n* is the degrees of the central angle

***Area of Sector:*** $\frac{n}{360}$ $∙πr^{2}$

**Probability**

***Conditional:*** $P\left(B\right)=P(A+B)÷P(B)$

***Addition Rule:***$P\left(A or B\right)=P\left(A\right)+P\left(B\right)- P(A+B)$

**A**

Angle = arc ÷ 2

**A**

Angle = arc ÷ 2

**A**

Angle = arc

**A**

Angle = $\frac{far-near}{2}$

**A**

Angle = (sum of arcs) ÷ 2

***a***

***c***

***b***

***d***

$$a∙c=b∙d$$

**A**

**B**

**D**

$$\left(A+B\right)B=D^{2}$$

**B**

**A**

**D**

**C**

$$\left(A+B\right)B=\left(C+D\right)D$$

**Surface Area Formulas**

r

$$SA=4πr^{2}$$

h

r

l

$$SA=πr^{2}+πrl$$

h

r

$$SA=2πr^{2}+2πrh$$

h

w

l

$$SA=2lw+2wh+2lh$$

l

$$SA=B+\frac{1}{2}Pl$$