

## Formula Sheet

### Order of Operations

$$ac + bc = c(a + b)$$

#### exponents

$$a^n a^m = a^{n+m}$$

$$(a^n)^m = a^{nm}$$

$$(ab)^n = a^n b^n$$

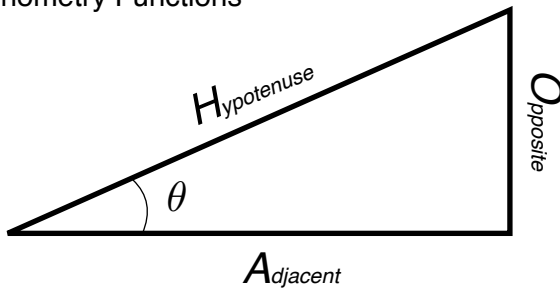
$$a^0 = 1$$

$$a^{-n} = \frac{1}{a^n}$$

#### radicals

$$a^{\frac{n}{m}} = \sqrt[m]{a^n}$$

### Trigonometry Functions



$$\sin(\theta) = \frac{O}{H} \quad \sin^{-1}\left(\frac{O}{H}\right) = \theta$$

$$\cos(\theta) = \frac{A}{H} \quad \cos^{-1}\left(\frac{A}{H}\right) = \theta$$

$$\tan(\theta) = \frac{O}{A} \quad \tan^{-1}\left(\frac{O}{A}\right) = \theta$$

### Pythagoras Theorem

$$H^2 = O^2 + A^2$$

### Relative Velocity

$$\vec{v}_{\frac{A}{C}} = \vec{v}_{\frac{A}{B}} + \vec{v}_{\frac{B}{C}}$$

$$\vec{v}_{\frac{B}{A}} = -\vec{v}_{\frac{A}{B}}$$

### Linear equations (Cramer's rule)

$$x_i = \frac{\det(A_i)}{\det(A)}$$

### Forms of a 1st order polynomial

$$y = ax + b$$

### Forms of a 2nd order polynomial

$$y = ax^2 + bx + c$$

$$y = a(x - h)^2 + k$$

$$y = a(x - m)(x - n)$$

### Quadratic Equation

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

### Unit Conversions

#### angles

$$2\pi = 6.28 \text{ rad} = 360^\circ :$$

#### mass

$$1 \text{ kg} = 2.2 \text{ lbs.}$$

#### lengths

$$1 \text{ mile} = 1.6 \text{ km}$$

$$1 \text{ inch} = 2.54 \text{ cm}$$

$$1 \text{ m} = 3.3 \text{ ft}$$

#### volumes

$$1 \text{ gallon} = 3.78 \text{ Litres}$$