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## TX PACT: MATHEMATICS: GRADES 4-8 FORMULAS AND NOTATION

| Formula | Description |
| :---: | :---: |
| $V=\frac{1}{3} B h$ | Volume of a right cone and a pyramid |
| $V=\pi r^{2} h$ | Volume of a cylinder |
| $V=\frac{4}{3} \pi r^{3}$ | Volume of a sphere |
| $A=4 \pi r^{2}$ | Surface area of a sphere |
| $A=\pi r \sqrt{r^{2}+h^{2}}$ | Lateral surface area of a right circular cone |
| $S_{n}=\frac{n}{2}[2 a+(n-1) d]=n\left(\frac{a+a_{n}}{2}\right)$ | Sum of an arithmetic series |
| $S_{n}=\frac{a\left(1-r^{n}\right)}{1-r}$ | Sum of a geometric series |
| $\sum_{n=0}^{\infty} a r^{n}=\frac{a}{1-r},\|r\|<1$ | Sum of an infinite geometric series |
| $d=\sqrt{\left(x_{2}-x_{1}\right)^{2}+\left(y_{2}-y_{1}\right)^{2}}$ | Distance formula |
| $\left(\frac{x_{1}+x_{2}}{2}, \frac{y_{1}+y_{2}}{2}\right)$ | Midpoint formula |
| $\frac{a}{\sin A}=\frac{b}{\sin B}=\frac{c}{\sin C}$ | Law of sines |
| $c^{2}=a^{2}+b^{2}-2 a b \cos C$ | Law of cosines |
| $s^{2}=\frac{\sum_{i=1}^{n}\left(x_{i}-\bar{x}\right)^{2}}{n-1}$ | Variance |
| $s=r \theta$ | Arc length |
| $x=\frac{-b \pm \sqrt{b^{2}-4 a c}}{2 a}$ | Quadratic formula |
| $\bar{A}$ is the complement of set $A$ | Set theory |
| ${ }_{n} \mathrm{P}_{r}=\mathrm{P}(n, r)=\frac{n!}{(n-r)!}$ |  |
| ${ }_{n} \mathrm{C}_{r}=\mathrm{C}(n, r)=\frac{n!}{(n-r)!r!}$ |  |

