TABLE OF FORMULAS

1. **CIRCLE**

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

2. **PARABOLA**

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

The graph of the function

$$y=f(x)=ax^2+bx+c \quad (a\neq 0)$$

is a parabola with vertex at $\left(-\frac{b}{2a},\ c-\frac{b^2}{4a}\right)$.

3. **COMPOUND INTEREST FORMULA**. A principal P, earning interest compounded k times a year for n years at an annual rate r, will grow to the future value FV according to the formula

$$FV=P(1+i)^{kn}$$

where $i=\frac{r}{k}$ is the periodic interest rate.

4. **EFFECTIVE RATE OF INTEREST**. The effective rate of interest R for an account paying a nominal rate r, compounded k times per year, is

$$R=(1+i)^k-1$$

where i is the periodic rate, $i=\frac{r}{k}$.

5. **PRESENT VALUE**. The present value PV that must be deposited now to provide a future value, FV, n years from now is given by the formula

$$PV=FV(1+i)^{-kn}$$

where interest is compounded k times per year at an annual rate r (i is the periodic rate, $\frac{r}{k}$).

6. **FUTURE VALUE OF AN ANNUITY**. The future value FV of an ordinary annuity with deposits of P dollars made regularly k times each year for n years, with interest compounded k times per year at an annual rate r, is

$$FV = \frac{P[(1+i)^{kn} - 1]}{i}$$

where i is the periodic rate, $i = \frac{r}{k}$.

7. **SINKING FUND PAYMENT**. For an annuity to provide a future value FV, regular deposits P are made k times per year for n years, with interest compounded k times per year at an annual rate r. The payment P is given by

$$P = \frac{FVi}{(1+i)^{kn} - 1}$$

where i is the periodic rate, $i = \dfrac{r}{k}$.

8. **PRESENT VALUE OF AN ANNUITY**. The present value PV of an annuity with payments of P dollars made k times per year for n years, with interest compounded k times per year at an annual rate r, is

$$PV = \frac{P[1 - (1+i)^{-kn}]}{i}$$

where i is the periodic rate, $i = \frac{r}{k}$.

9. **INSTALLMENT PAYMENTS**. The periodic payment P required to repay an amount A is given by

$$P = \frac{Ai}{1 - (1+i)^{-kn}}$$

where

r is the annual rate,

k is the frequency of compounding (usually monthly),

i is the periodic rate, $i = \frac{r}{k}$, and

n is the term of the loan in years.