## Formulas for AF4

| Name | Purpose | Information Required | Formula |
| :---: | :---: | :---: | :---: |
| Future Value | To calculate what a given amount of money will grow to over a set period of time | $\begin{gathered} \text { Current Value (PV) } \\ \text { Rate of return (r) } \\ \text { Time period }(t) \\ \hline \end{gathered}$ | $F V=P V(1+r)^{t}$ |
| Discounting | To calculate how much you need to invest now to achieve a target amount in a set period | Target value (FV) Rate of return Time period | $\mathrm{PV}=\frac{\mathrm{FV}}{(1+r)^{n}}$ |
| Rate of return | To calculate the rate of return given the original and final investment |  | $\mathrm{R}=(\mathrm{FV} / \mathrm{PV})^{1 / \mathrm{n}}-1$ |
| Annual Equivalent Return | To calculate the annual rate of return when interest is paid more regularly than annually | Annual interest Payment frequency | Divide annual rate by frequency <br> Assume starting point of $£ 1,000$ <br> Compound up treating each period as a year. <br> Take end result, deduct $£ 1,000$ and divide by 10 to get final figure |
| Gilt Running Yield | To calculate annual return when a gilt is purchased mid term | Coupon Clean price | Coupon <br> Clean price$\times 100$ |
| Gilt yield to redemption | To calculate yield if gilt is held to redemption taking into account any gain or loss | Running Yield Clean price Years to redemption | Running Yield $\pm \underline{\text { Gain/loss } \div \text { Years to redemption } \times 100 ~}$ <br> Clean Price <br> 1. Calculate Running Yield as above <br> 2. Calculate loss or gain if gilt held until maturity <br> 3. Divide this by number of years to redemption <br> 4. Divide this by clean price and multiply by 100 <br> 5. Deduct this from running yield. |


| Market Capitalisation | To calculate total value of a company's shares | Share price Number of shares | Share price x number of shares |
| :---: | :---: | :---: | :---: |
| Earnings per share | To calculate how much profit is attributable to each share | Earnings attributable to shareholders <br> Number of shares | Total earnings (less any payments to bondholders)/number of shares |
| Price Earnings ratio | To calculate the multiple of earnings the shares are trading at. In general terms a high P/E indicates a greater confidence than a share with a low P/E | Earnings per share Share Price | share price/earnings per share |
| Dividend yield | To calculate income yield on current share price | Share price Dividend amount | Dividend/Share price $\times 100$ |
| Dividend cover | To identify how likely it is that the company can maintain its dividend The higher the number the more likely the company will be able to continue paying its dividend | Earnings per share Dividend | Earnings per share/dividend |
| Gross Rental Yield | To calculate the yield on a rental property as a percentage of the property value | Purchase price of property Acquisition costs Gross rent Annual costs | Gross Rental less annual costs* <br> Purchase price + acquisition costs <br> - *Mortgage Interest costs should not be included |

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\begin{array}{|l|l|l|l|}\hline \begin{array}{l}\text { Discount or } \\
\text { premium on } \\
\text { Investment } \\
\text { Trust shares }\end{array} & \begin{array}{l}\text { To calculate amount of premium or } \\
\text { discount on IT shares }\end{array} & \begin{array}{l}\text { Net Asset Value per share } \\
\text { Share Price }\end{array} & \begin{array}{l}\text { If share price is higher than NAV then shares are trading at } \\
\text { a premium } \\
\text { If share price is lower than NAV the shares are trading at a } \\
\text { discount } \\
\text { Premium } \\
\text { NAV less Share Price }\end{array} \\
\text { NAV }\end{array}
$$\right] \begin{array}{l}Discount <br>

Share Price less NAV\end{array}\right]\)| NAV |
| :--- |


| Information ratio | To identify the consistency of a manager in achieving risk adjusted returns | Actual return <br> Benchmark return SD of actual return compared to benchmark return | Actual return less Benchmark return <br> Tracking error of portfolio (Standard deviation of difference between portfolio and benchmark |
| :---: | :---: | :---: | :---: |
| Alpha | To identify value added by manager | CAPM expected return Actual return | Actual return less CAPM or return on benchmark |
| Holding Period Return | To show annual return | Opening Value, Closing value, dividends | $\frac{\text { Closing value less Opening Value + dividend }}{\text { Opening value }} \times 100$ |
| Money <br> Weighted <br> Return | Annual Return without the distortions of money in or out | As above plus amount of money added or withdrawn and the date of this | $\begin{aligned} & \hline(\mathrm{v} 1-\mathrm{v} 0)-\mathrm{C} \\ & \mathrm{v} 0+(\mathrm{C} \times \mathrm{n} / 12) \end{aligned}$ <br> V1 = Closing value <br> V2 = opening value <br> C is added money <br> N I number of months new money invested <br> If money is taken out $\frac{(v 1-v 0)+C}{v 0-(C \times n / 12)}$ <br> Here $\mathrm{n}=$ number of months the withdrawn money was not available |
| Time weighted Return | To compare two manager's performance taking away distortion of money in and out | As above plus amount of money added or withdrawn and the date of this | Calculate HPR for each period Express as a decimal rather than a percentage Add 1 to each Multiply these two figures together Deduct 1 from the answer and multiply by 100 |

