 Establish the meaning of k

How does the exponential growth constant, k>0, relate to a standard annualised percentage increase (compound growth) per time period?

* Exponential model:
* Compound Interest Model:

For the models to be equivalent

Taking the natural log of both sides

| Rate of compound growth | Equivalent k value (3 d.p.) |
| --- | --- |
| 10% |  0.095 |
| 20% |  0.182 |
| 30% |  0.262 |

Given a k value, what is the equivalent rate of compound growth per time period?

| k value | Rate of compound growth (4d.p.) |
| --- | --- |
| 1.2 | = 2.3201 or 232.01% |
| 0.05 | = 0.0513 or 5.13% |
| 0.25 | = 0.2840 or 28.40% |

How does the exponential decay constant, k<0, relate to a standard annualised percentage decrease (depreciation) per time period?

* Exponential model:
* Compound interest model:

For the models to be equivalent

Taking the natural log of both sides

| Rate of depreciation | Equivalent k value (3 d.p.) |
| --- | --- |
| 10% |  -0.105 |
| 20% |  -0.223 |
| 30% |  -0.357 |

Given a k value, what is the equivalent rate of compound growth per time period?

| k value | Rate of Depreciation (4d.p.) |
| --- | --- |
| -0.2 | = 0.1813 or 18.13% |
| -0.025 | = 0.0247 or 2.47% |
| -1.5 | = 0.7769 or 77.69% |