$\qquad$
Simple: $A=P+(P r) t$
Compound: $A=P(1+r)^{t}$

1. Adil has $\$ 1,200$ to deposit into an account with an interest rate of $5 \%$. Use the simple and compound interest formulas to complete the table. Round to the NEAREST CENT.
a. If it costs $\$ 300.00$ to have your savings in a compound interest account, would it make sense to use that account if you were only going to save your money for 10 years?
b. What about for 20 years?

| Quantity | Time | Simple Interest <br> Balance | Compound <br> Interest Balance |
| :---: | :---: | :---: | :---: |
| Units |  |  |  |
|  |  |  |  |
|  | 0 |  |  |
|  | 3 |  |  |
| 10 |  |  |  |
| 20 |  |  |  |

2. Bryce City has a population of 26,000 . Its population is increasing at a rate of $3.5 \%$.

- Write a function to represent the population over time. $\quad P(t)=P(1+r)^{t}$
- Determine the population after a given number of years. Round to the nearest WHOLE NUMBER.
a. 2 years
b. 10 years
c. 20 years

3. Khanyaville has a population of 85,000 . Its population is decreasing at a rate of $2.5 \%$.

- Write a function to represent the population over time. $\quad P(t)=P(1-r)^{t}$
- Determine the population after a given number of years. Round to the nearest WHOLE NUMBER.
a. 8 years
b. 5 years
c. 16 years

Complete the table. Graph each exponential function. Identify the $y$-intercept, asymptote, domain, and range. Type each expression into the calculator exactly as it is written, replacing $x$ with its value.
4. $y=2^{x}$

| $\mathbf{x}$ | $\mathbf{y}$ |
| :---: | :---: |
| -2 |  |
| -1 |  |
| 0 |  |
| 1 |  |
| 2 |  |

$y$-intercept:
domain:

range:
5. $y=\left(\frac{1}{4}\right)^{x}$

| $\mathbf{x}$ | $\mathbf{y}$ |
| :---: | :---: |
| -2 |  |
| -1 |  |
| 0 |  |
| 1 |  |
| 2 |  |

$y$-intercept:
domain:

asymptote:
range:
7. $y=-3 \cdot\left(\frac{1}{2}\right)^{x}$

| $\mathbf{x}$ | $\mathbf{y}$ |
| :---: | :---: |
| -2 |  |
| -1 |  |
| 0 |  |
| 1 |  |
| 2 |  |

$y$-intercept:
domain:
asymptote:
range:
8. Write the equation of each new function $g(x)$ after the translation.
a. $f(x)=-8 x$ after a translation $\mathbf{6}$ units to the right
b. $f(x)=4^{x}$ after a translation 3 units up
c. $f(x)=2 x^{2}$ after a translation 2 units left
d. $f(x)=4 x$ after a translation 7 units down
e. $f(x)=\left(\frac{1}{2}\right)^{x}$ after a translation 4 units to the right
f. $f(x)=x^{2}$ after a translation 4 units down
9. Describe each graph in relation to its basic function, i.e. vertical translation up 8 units.
a. Compare the basic function $f(x)=x^{2}$ to $g(x)=(x+2)^{2}$
b. Compare the basic function $f(x)=b^{x}$ to $g(x)=b^{x}+1$
c. Compare the basic function $f(x)=2^{x}$ to $g(x)=2^{(x-7)}$
d. Compare the basic function $f(x)=4 x^{2}$ to $g(x)=4(x-9)^{2}$
e. Compare the basic function $f(x)=b^{x}$ to $g(x)=b^{(x-2)}$
f. Compare the basic function $f(x)=\left(\frac{1}{2}\right)^{x}$ to $g(x)=\left(\frac{1}{2}\right)^{(x+4)}$
10. Each coordinate plane shows the graph of the basic function. Sketch the graph of $g(x)$.
a. $g(x)=b^{(x-4)}$

c. $g(x)=f(x)+2$

e. $g(x)=b^{x}-3$

b. $g(x)=f(x+5)$

d. $g(x)=b^{x}-7$

f. $g(x)=b^{(x-3)}$


