Create a table of values for the following 3 relations (decimals are OK for the third). Calculate the first and second differences for each relation. Then, graph them on the provided grid.

|  |  |
| --- | --- |
| Relation: $y=2x$ | Graph: |
| $$x$$ | $$y$$ | 1st Diff. | 2nd Diff. |
| -3 |  |  |
| -2 |  |
| -1 |  |
| 0 |  |
| 1 |  |
| 2 |  |
| 3 |  |

|  |  |
| --- | --- |
| Relation: $y=x^{2}$ | Graph: |
| $$x$$ | $$y$$ | 1st Diff. | 2nd Diff. |
| -3 |  |  |
| -2 |  |
| -1 |  |
| 0 |  |
| 1 |  |
| 2 |  |
| 3 |  |

|  |  |
| --- | --- |
| Relation: $y=2^{x}$ | Graph: |
| $$x$$ | $$y$$ | 1st Diff. | 2nd Diff. |
| -3 |  |  |
| -2 |  |
| -1 |  |
| 0 |  |
| 1 |  |
| 2 |  |
| 3 |  |

2) Describe the 4 transformations from the basic parabola $y=x^{2}$ that the following quadratic relations undergoes: $y=-3\left(x+2\right)^{2}+5$

3) Graph the following two quadratic relations:

a) $y=1.5(x-4)^{2}-2$ b) $y=-2.5(x-1)(x+3)$

4) Find equation (in vertex form) of a parabola with a vertex of (5, 4), with a y-intercept of 16.5.

5) Find the equation (in factored form) of a parabola with x-intercepts of 5 and -1, with a maximum value of 10.