**Plotting Non-Linear Graphs – Create-a-Picture**

For each of the following equations, complete the table of values and plot the graph of the equation between the $x$-values given. Give $y$-coordinates to 1 decimal place where appropriate.

**1.** $y=0.11x^{3}-13$ $\{-2\leq x\leq 4\}$

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| $$x$$ | $$-2$$ | $$-1$$ | $$0$$ | $$1$$ | $$2$$ | $$3$$ | $$4$$ |
| $$y$$ |  |  |  |  |  |  |  |

**2.** $y=0.5(x-6)^{3}-2$ $\{4\leq x\leq 6\}$

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| $$x$$ | $$4$$ | $$4.25$$ | $$4.5$$ | $$4.75$$ | $$5$$ | $$5.25$$ | $$5.5$$ | $$5.75$$ | $$6$$ |
| $$y$$ |  |  |  |  |  |  |  |  |  |

**3.** $y=-\frac{x^{2}}{16}-5$ $ \{-4\leq x\leq 4\}$

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| $$x$$ | $$-4$$ | $$-3$$ | $$-2$$ | $$-1$$ | $$0$$ | $$1$$ | $$2$$ | $$3$$ | $$4$$ |
| $$y$$ |  |  |  |  |  |  |  |  |  |

**4.** $y=x^{2}+2x-14$ $\{-4.2\leq x\leq -2\}$

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| $$x$$ | $$-4.2$$ | $$-4$$ | $$-3.5$$ | $$-3$$ | $$-2.5$$ | $$-2$$ |
| $$y$$ |  |  |  |  |  |  |

**5.** $y=-0.15\left(x-2\right)^{2}+1.5$ $\{-4.2\leq x\leq 6.3\}$

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| $$x$$ | $$-4.2$$ | $$-2.1$$ | $$0$$ | $$2.1$$ | $$4.2$$ | $$6.3$$ |
| $$y$$ |  |  |  |  |  |  |

**6.** $y=-\frac{x^{2}}{16}-3.5$ $\{-4.2\leq x\leq 4.2\}$

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| $$x$$ | $$-4.2$$ | $$-3$$ | $$-2$$ | $$-1$$ | $$0$$ | $$1$$ | $$2$$ | $$3$$ | $$4.2$$ |
| $$y$$ |  |  |  |  |  |  |  |  |  |

**7.** $y=0.08(x+2)^{2}(x-2)^{2}-9$ $\{-3.2\leq x\leq 3.2\}$

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| $$x$$ | $$-3.2$$ | $$-2$$ | $$-1$$ | $$0$$ | $$1$$ | $$2$$ | $$3.2$$ |
| $$y$$ |  |  |  |  |  |  |  |

Now add the following circle:

**8**. $(x-7)^{2}+(y+2)^{2}=1$

**9**. $(x+1.5)^{2}+(y+6.5)^{2}=0.5$

**10**. $(x-1.5)^{2}+(y+6.5)^{2}=0.5$

Finally, colour in your picture!

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