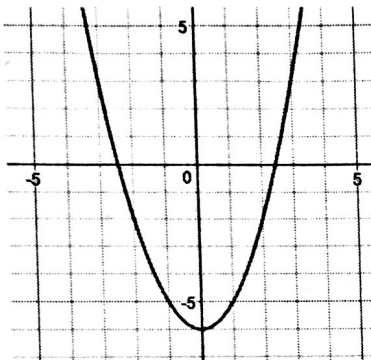|	Name	Period	Date

READY

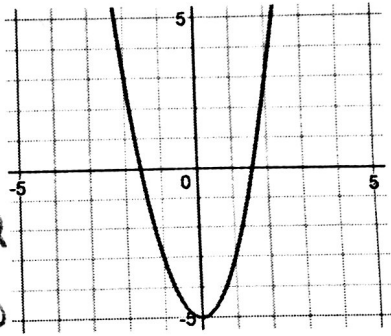Topic: Recalling transformations on quadratic functions

Describe the transformation of each function. Then write the equation in vertex form.
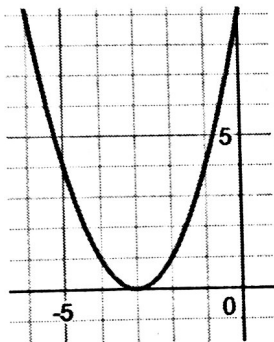
1. Description:

· Translated down 6

Equation:

$f(x) = x^2 - 6$

2. Description:

· Translated down 5
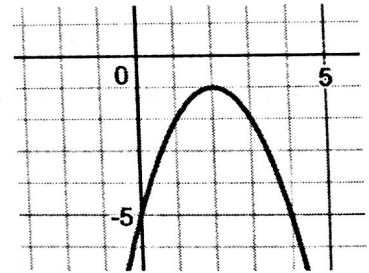· Vertical stretch by a factor of 2

Equation:

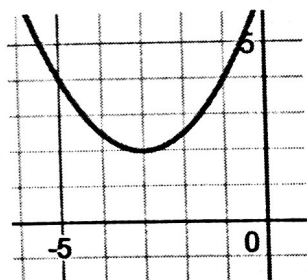$f(x) = 2x^2 - 5$

3. Description:

· Translated left 3

Equation:

$f(x) = (x+3)^2$

4. Description:

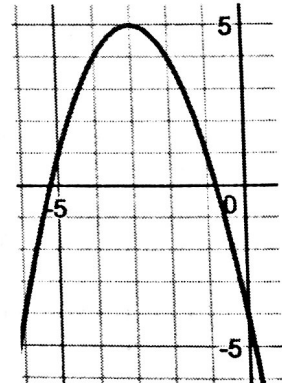· Reflection over the x-axis
· Translated right 2 and down 1

Equation:

$f(x) = -(x-2)^2 - 1$

5. Description:

· Translated left 3 and up 2
· Vertical stretch by a factor of 1/2

Equation:

$f(x) = \frac{1}{2}(x+3)^2 + 2$

6. Description:

· Reflected over the x-axis
· Translated left 3 and up 5

Equation:

$f(x) = -(x+3)^2 + 5$

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SET
Topic: Exploring a rational function

Chile is celebrating her Quinceañera. Hannah knows the perfect gift to buy Chile, but it costs $360. Hannah can't afford to pay for this on her own so thinks about asking some friends to join in and share the cost.

7. How much would each person spend if there were two people dividing the cost of the gift? $\frac{360}{2} = \$180$
   How much would each person spend if there were five people dividing the cost? $\frac{360}{5} = \$72$
   Ten people? $\frac{360}{10} = \$36$ One hundred? $\frac{360}{100} = \$3.60$

8. The function that models this situation is $f(x) = \frac{360}{x}$. Define the meaning of the numerator and the denominator within the context of the story. *The numerator represents the total cost. The denominator represents the # of friends purchasing the gift.*

9. Create a table and a graph to show how the amount each person would contribute to the gift would change, depending on the number of people contributing.

$X = \#$ of friends $f(x) =$ amt each friend contributes

X	f(x)
1	360
2	180
3	120
4	90
5	72
10	36
20	18
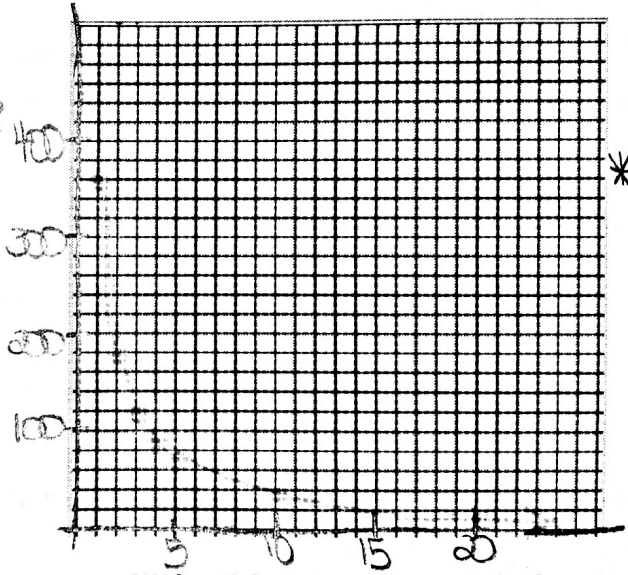
* Can also leave graph discrete

10. Hannah created a fundraising site on the internet. Within 5 days, enough people had registered so that each friend, including Hannah, only needed to donate $0.50.

   a. How many people had registered in 5 days? $\frac{360}{x} = 0.50$ $X = 720$ people

   b. By the day of the event, enough people had registered that each friend, including Hannah, only donated 10¢. How many friends had registered? $\frac{360}{x} = .10$ $X = 3600$ people

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GO

Topic: Reviewing the horizontal asymptote in an exponential function

All exponential functions have a horizontal asymptote. All of the graphs below show exponential functions.

Match the function rule with the correct graph. Then write the equation of the horizontal asymptote.

11. $f(x) = 2^x$ _c_

Equation of horizontal asymptote:
_y = 0_

12. $g(x) = 2^x - 3$ _f_

Equation of horizontal asymptote:
_y = -3_

13. $h(x) = 2^{x-3}$ _e_

Equation of horizontal asymptote:
_y = 0_

14. $m(x) = -(2^x) - 3$ _b_

Equation of horizontal asymptote:
_y = -3_

15. $q(x) = 2^{(-x)} + 3$ _a_
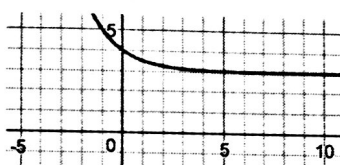
Equation of horizontal asymptote:
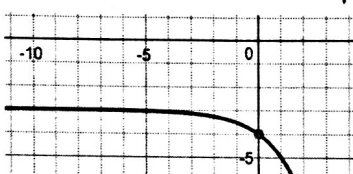_y = 3_

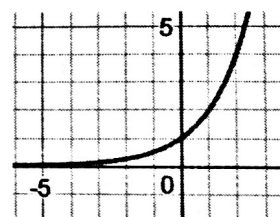16. $r(x) = -2^{(-x)}$ _d_

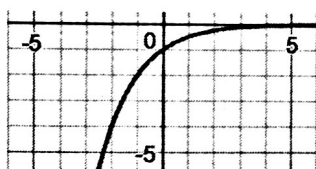Equation of horizontal asymptote:
_y = 0_
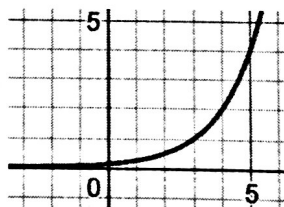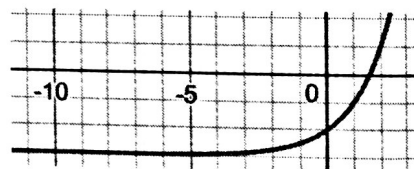
_15_ a.

_14_ b.

_11_ c.

_16_ d.

_13_ e.

_12_ f.

17. Use $f(x) = ab^{(x-h)} + k$ to explain which values affect the position of the horizontal asymptote in an exponential function. Be precise.

The "K" value determines the position of the hor. asy. (Horiz. asy. is y=k)

18. Why does an exponential function have a horizontal asymptote?

The base "b" is always positive. When you raise a positive base to a power, you cannot get a negative answer and you cannot get 0 (though you get really close if b>1 and exponent is negative, or when b<1 and exponent is positive)

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