

H

So many Answers!!!

Unit 1 Review - Transformations of Functions and Symmetry

Transformations of Functions

Using the function $f(x) = 3^x$ write a function that has the given transformations.

1. A vertical shift up 5 units
2. A steeper slope by a factor of 4
3. A vertical shift down 3 units and a reflection across the x-axis
4. Write all the transformations that occur to the parent graph for the function

$$g(x) = (3^x) + 5$$

$$g(x) = 4(3^x)$$

$$g(x) = -(3^x) - 3$$

$$y = -\frac{5}{4}x - 9$$

translates down

vertical stretch by $\frac{5}{4}$

reflects over x-axis

5. The function $f(x)$ has been graphed on the coordinate grid. Sketch the following functions given the transformations. Make sure to label each line on the graph.

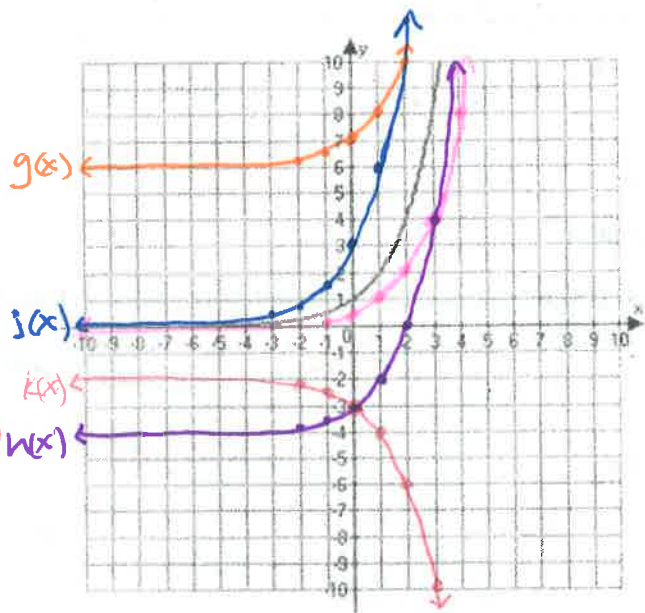
$g(x) = f(x) + 6$ up 6 (y-value +6)

$h(x) = f(x) - 4$ down 4 (y-value -4)

$j(x) = 3f(x)$ stretch by 3 (mult. y value by 3)

$k(x) = -f(x) - 2$ reflect over x-axis & down 2 (make y value neg, change sign, subtract)

$n(x) = \frac{1}{2}f(x)$ compress by $\frac{1}{2}$ (mult. y value by $\frac{1}{2}$)



Symmetry

Draw the lines of symmetry for each graph and describe the order and magnitude (in degrees) of each that map the object onto itself.

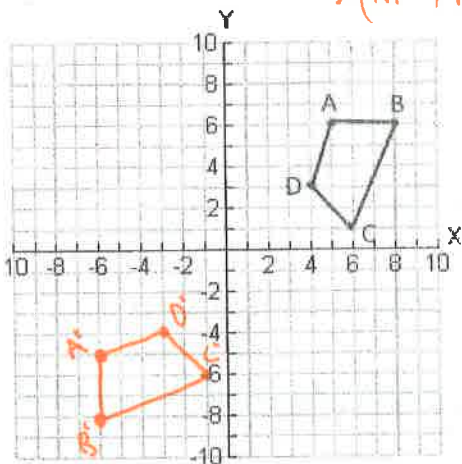
6.
 order 5
 mag = $\frac{360}{5} = 72^\circ$

7.
 order 4
 mag = $\frac{360}{4} = 90^\circ$

8.
 order 1
 mag = $\frac{360}{1} = 360^\circ$

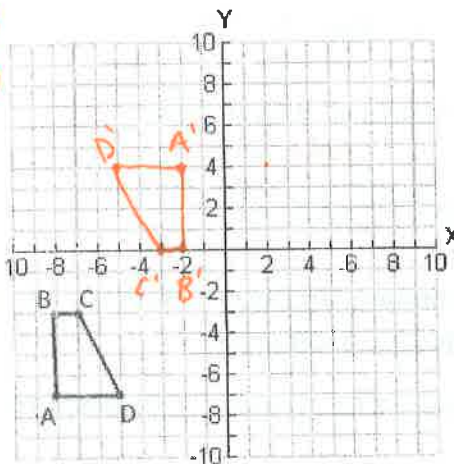
Combining Transformations -- Make sure you label the post-image.

18. R_{90} and $R_{x\text{-axis}}$



$A=(5,6)$ $B=(8,6)$
 \downarrow \downarrow
 $(-6,5)$ $(-6,8)$
 \downarrow \downarrow
 $(-6,-5)$ $(-6,-8)$
 $C=(6,1)$ $D=(4,3)$
 \downarrow \downarrow
 $(-1,-6)$ $(-3,-4)$
 \downarrow \downarrow
 $(-1,-6)$ $(-3,-4)$

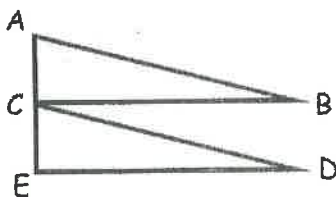
19. $T(x+10, y+3)$ and R_{180}



$A=(-8,-5)$ $B=(-6,-5)$
 \downarrow \downarrow
 $(2,-4)$ $(2,0)$
 \downarrow \downarrow
 $(-2,4)$ $(-2,0)$
 $C=(-6,-2)$ $D=(-8,-2)$
 \downarrow \downarrow
 $(3,0)$ $(5,-4)$
 \downarrow \downarrow
 $(-3,0)$ $(-5,4)$

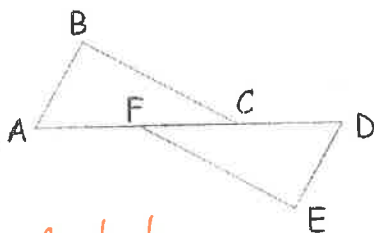
Name the transformation that maps each figure.

20. $\triangle ABC \rightarrow \triangle CDE$



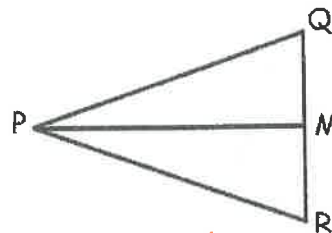
translation

21. $\triangle ABC \rightarrow \triangle DEF$



Rotation

22. $\triangle PQR \rightarrow \triangle PMQ$



Reflection

23.



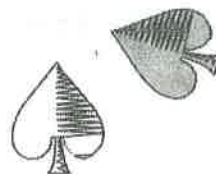
translation

24.



Reflection
or
Rotation

25.



~~Reflection~~
Rotation