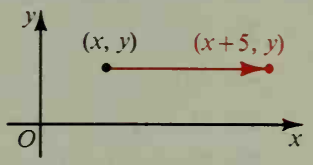
Classroom Exercises

The symbol 2^{-1} stands for the multiplicative inverse of 2, or $\frac{1}{2}$. Give the value of each of the following.

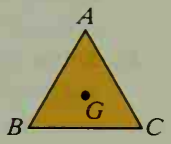
1. 3^{-1}
2. 7^{-1}
3. $(\frac{4}{5})^{-1}$
4. $(2^{-1})^{-1}$

The translation T maps all points five units to the right. Describe each of the following transformations.



5. T^2
6. T^3
7. T^{-1}
8. T^{-2}
9. $T \circ T^{-1}$
10. $(T^{-1})^{-1}$

The rotation $\mathcal{R}$ maps all points 120° about G, the center of equilateral $\triangle ABC$. Give the image of A under each rotation.



11. $\mathcal{R}$
12. $\mathcal{R}^2$
13. $\mathcal{R}^3$
14. $\mathcal{R}^6$
15. $\mathcal{R}^{-1}$
16. $\mathcal{R}^{-2}$
17. $\mathcal{R}^2 \circ \mathcal{R}^{-2}$
18. $\mathcal{R}^2 \circ \mathcal{R}^{-3}$
19. $\mathcal{R}^{100}$

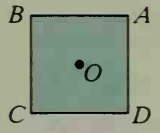
20. What number is the identity for multiplication?
21. The product of any number t and the identity for multiplication is ___?___.
22. The product of any transformation T and the identity is ___?___.
23. State the inverse of each transformation.
    a. R_l b. $\mathcal{R}_{O,\,30}$ c. $T:(x, y) \rightarrow (x - 4, y + 1)$ d. $D_{O,\,-1}$
24. Name an important difference between products of numbers and products of transformations.

Written Exercises

Give the value of each of the following.

A 1. 4^{-1}
2. 9^{-1}
3. $(\frac{2}{3})^{-1}$
4. $(5^{-1})^{-1}$

The rotation $\mathcal{R}$ maps all points 90° about O, the center of square $ABCD$. Give the image of A under each rotation.



5. $\mathcal{R}^2$
6. $\mathcal{R}^3$
7. $\mathcal{R}^4$
8. $\mathcal{R}^{-1}$
9. $\mathcal{R}^{-2}$
10. $\mathcal{R}^{-3}$
11. $\mathcal{R}^{-3} \circ \mathcal{R}^3$
12. $\mathcal{R}^5$
13. $\mathcal{R}^{50}$

Complete.

14. By definition, the identity mapping I maps every point P to ___?___.
15. H_O^2 is the same as the mapping ___?___.
16. The inverse of H_O is ___?___.
17. H_O^3 is the same as the mapping ___?___.