



MATHS

BOOKS - INDEPENDENTLY PUBLISHED

MATHS (ENGLISH)

TRANSFORMATION AND SYMMETRY

Examples

1. Suppose $y = f(x) = e^x$. Describe the graph of $y = e^x + 3$



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2. Suppose $y = x^2$. Describe the graph of $y = (x + 2)^2$.



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3. Suppose $y=x-1$. Describe the graph of $y=3(x-1)$.



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4. Suppose $y = x^3$. Describe the graph of y

$$= \left(\frac{1}{2}x\right)^3.$$



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5. Suppose $y = \ln x$. Describe the graphs of $y = -\ln x$ and $y = \ln(-x)$.



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6. Suppose $y=f(x)$. Use words to describe the transformation $y=f(-ax+b)$.



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7. Suppose $y = \sin x$. Describe the sequence of transformations to get the graph of $y = \sin(-2x + 1)$.



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8. Discuss the symmetry of $f(x) = \cos x$.



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9. Discuss the symmetry of $x^2 + xy + y^2 = 0$.



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Exercises

1. Which of the following functions transforms $y=f(x)$ moving it 5 units to the right?

A. $y=f(x+5)$

B. $y=f(x-5)$

C. $y=f(x)+5$

D. $y=f(x)-5$

Answer:



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2. Which of the following functions stretches

$y = \cos(x)$ vertically by a factor of 3?

A. $y = \cos(x + 3)$

B. $y = \cos(3x)$

C. $y = \cos\left(\frac{1}{3}x\right)$

D. $y = 3 \cos x$

Answer:



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3. The graph of $y=f(x)$ is shown.



Which of the following is the graph of $y=f(-x)-2$?

A.

B.

C.

D.

Answer:



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4. Which of the following is a transformation of $y=f(x)$ that translates this function down 3, shrinks it horizontally by a factor of 2, and reflects it about the x-axis?

A. $y = -2f(x - 3)$

B. $y = f(-2x) - 3$

C. $y = -f\left(\frac{1}{2}x\right) - 3$

D. $y = -f(2x) - 3$

Answer:



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