

**Describe how each function is transformed.**

1.  $g(x) = f(x) + 5$

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2.  $g(x) = 5f(x)$

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3.  $g(x) = f(x - 1)$

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4.  $g(x) = f\left(\frac{1}{2}x\right)$

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**Write the rule for function  $g(x)$ . Show work and simplify.**

5.  $g(x)$  reflects  $f(x) = x^3 + 2x + 3$  across the x-axis.

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6.  $g(x)$  reflects  $f(x) = x^3 - x + 1$  across the y-axis.

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7.  $g(x)$  compresses  $f(x) = x^4 + 2$  vertically by  $\frac{1}{2}$ .

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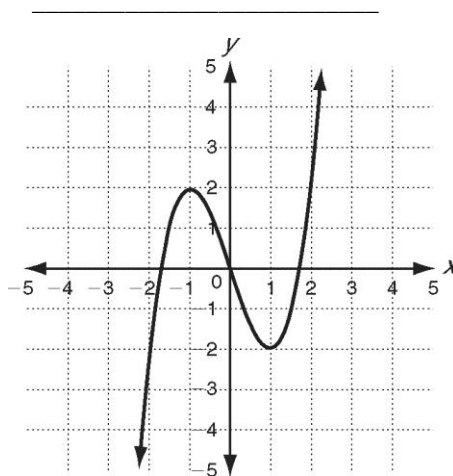
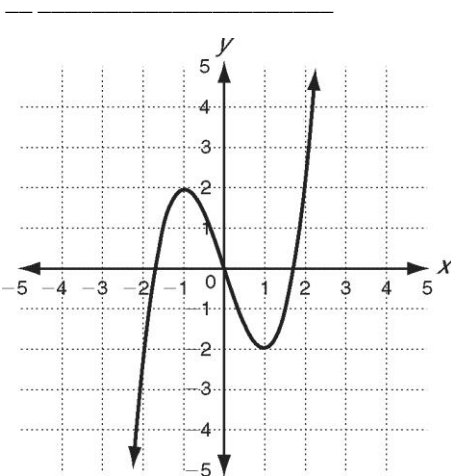
8.  $g(x)$  stretches  $f(x) = x^3 + x^2 - 6$  horizontally by 3.

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**For  $f(x) = x^3 - 3x$ , write a rule (show work and simplify) and sketch its graph.**

9. Translate 3 units up

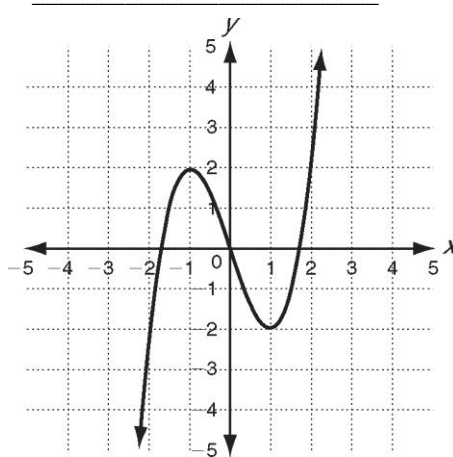
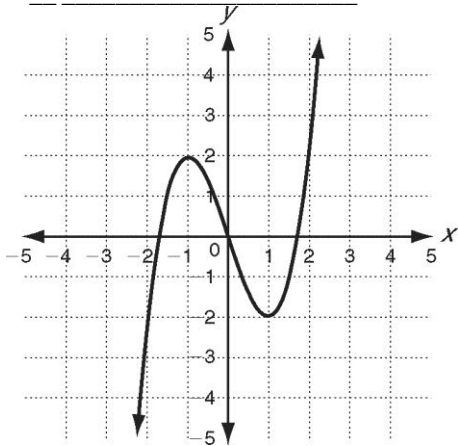
10. Stretch vertically by a factor of 2



For  $f(x) = x^3 - 3x$ , write a rule (show work and simplify) and sketch its graph.

11. Reflect across the  $y$ -axis

12. Translate 2 units left (do not multiply out)

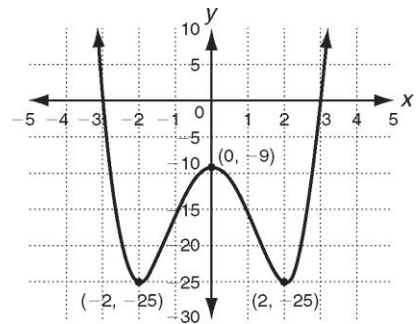


Write a function that transforms  $f(x) = x^3 + 4x^2 - x + 5$  in each of the following ways.

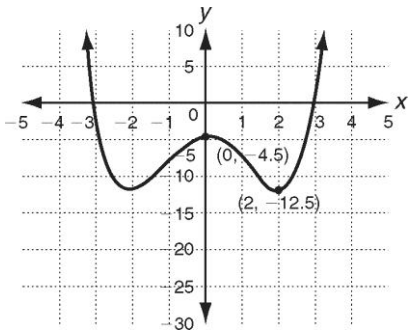
13. Move 6 units up and reflect across the  $y$ -axis. \_\_\_\_\_  
Show work and simplify.

14. Compress vertically by a factor of 0.25 and move 3 units right. \_\_\_\_\_  
Show work but do not expand powers of binomials.

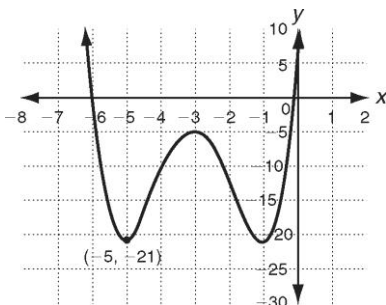
The graph at right represents the function  $f(x) = x^4 - 8x^2 - 9$ . Describe the transformation(s) of the function  $f(x) = x^4 - 8x^2 - 9$  that could be used to obtain each graph.



15.



16.



17.

