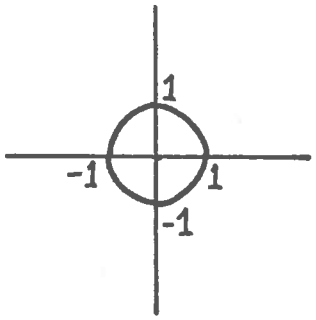
Equations in Two Variables

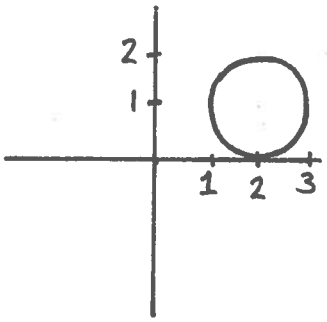
Geometry and algebra have an inverse relationship

1.)

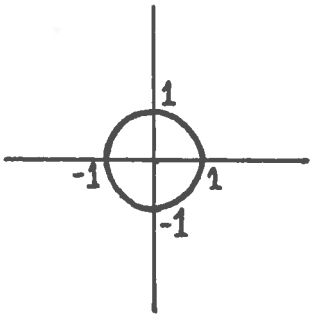


$x^2 + y^2 = 1$

right 2
up 1

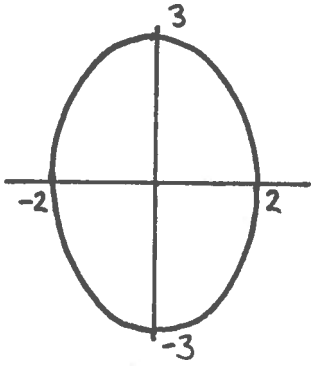


2.)

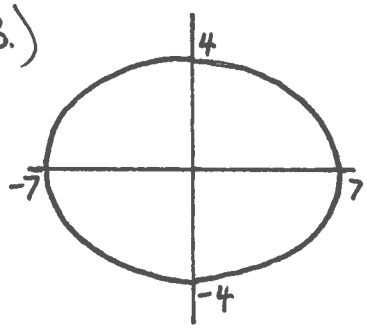


$x^2 + y^2 = 1$

scale x by 2
scale y by 3

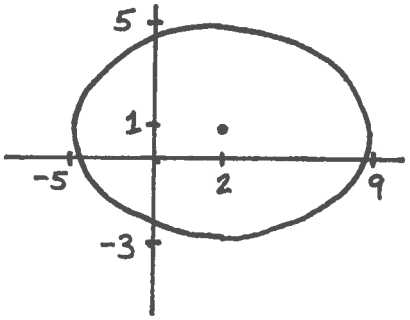


3.)



$\frac{x^2}{49} + \frac{y^2}{16} = 1$

right 2
up 1



Transformations of Graphs

(•) x goes inside a function, y comes out. $y \leftarrow f(\ x\ ) \rightarrow y$

In the first blank next to each function, write an X if the change from $f(x)$ is in the x-coordinate. Write a Y if the change is in the y-coordinate.

4.) $f(x+1)$ ____ ____ 5.) $2f(x)$ ____ ____ 6.) $f(\frac{x}{2})$ ____ ____

7.) $-f(x)$ ____ ____ 8.) $f(x)-1$ ____ ____ 9.) $f(x-1)$ ____ ____

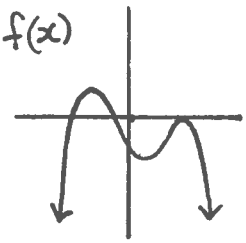
10.) $f(x)+1$ ____ ____ 11.) $f(2x)$ ____ ____ 12.) $\frac{1}{2}f(x)$ ____ ____ 13.) $f(-x)$ ____ ____

Inverse: Geometry of graph and algebra of X-change.

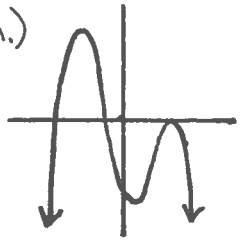
Agreement: Geometry of graph and algebra of Y-change.

In the second blanks, write the letter of the matching graph.

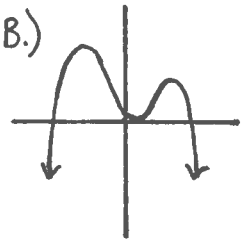
f(x)



A.)



B.)



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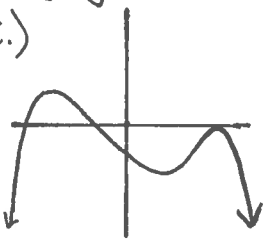

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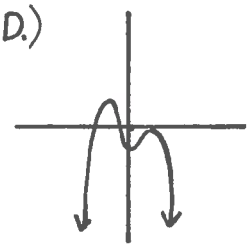

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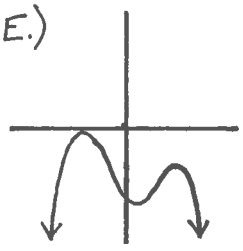

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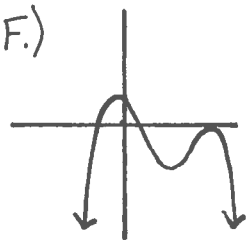
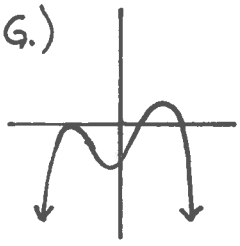
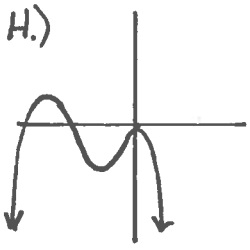


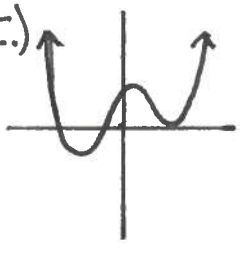
G.)



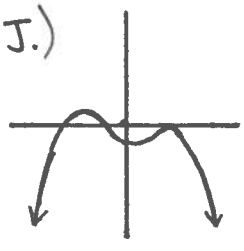
H.)



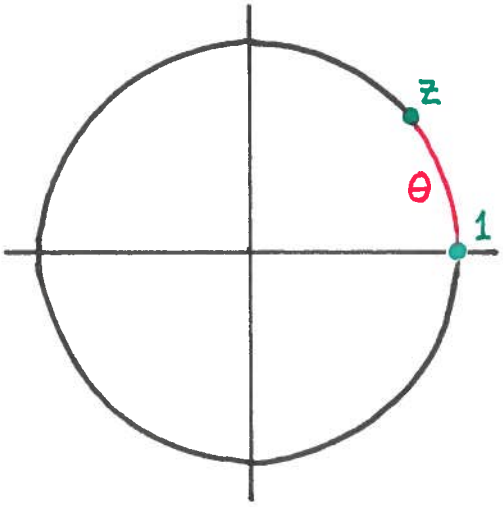
I.)

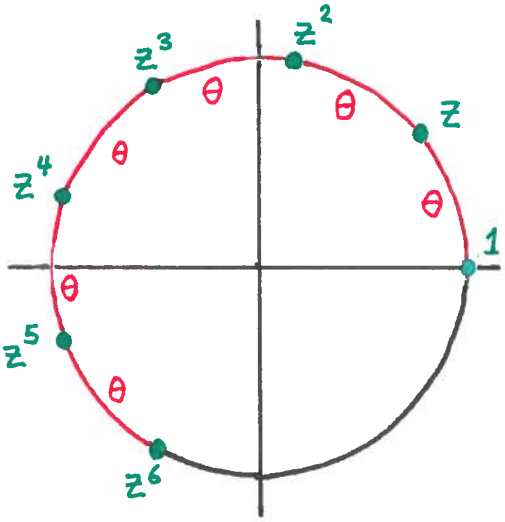


J.)



Multiplying Complex Numbers on the Unit Circle





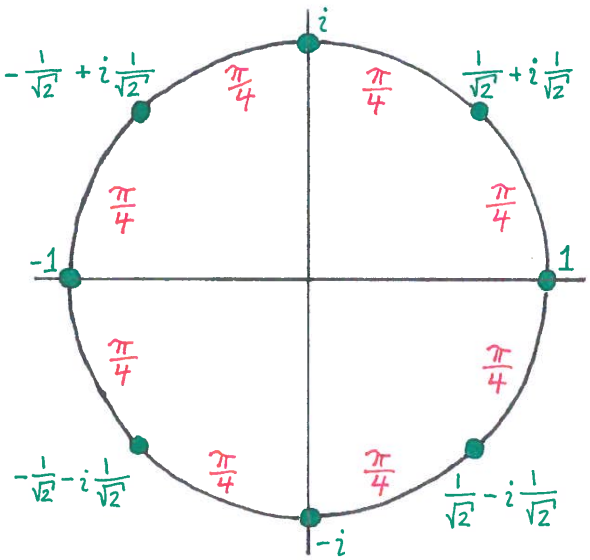
Find the following:

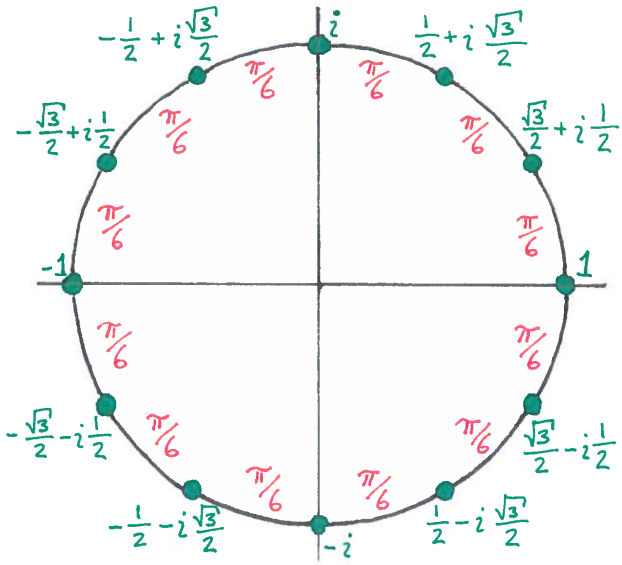
14.) $\left(\frac{1}{\sqrt{2}} + i\frac{1}{\sqrt{2}}\right)^5$

15.) $\left(\frac{\sqrt{3}}{2} + i\frac{1}{2}\right)^6$

16.) $\left(-\frac{1}{\sqrt{2}} + i\frac{1}{\sqrt{2}}\right)^2$

17.) $\left(\frac{1}{2} + i\frac{\sqrt{3}}{2}\right)^4$





Equations in One Variable

$h(x)f(x) = h(x)g(x)$ → $f(x) = g(x)$ or $h(x) = 0$

For #18-20, write the two equations that must be solved.

18.) $e^{3x}(2x-3) = e^{3x}(4x-7)$

19.) $(x-4)\log_e(x) = (x-4)5$

20.) $(x^2-5) = (x^2-5)x^3$

$af(x)^2 + bf(x) + c = 0$ → $f(x) = \dfrac{-b+\sqrt{b^2-4ac}}{2a}$ or $f(x) = \dfrac{-b-\sqrt{b^2-4ac}}{2a}$

For #21-22, write the two equations that must be solved.

21.) $2(x-3)^2 - 5(x-3) + 2 = 0$

22.) $\log_e(x)^2 + 3\log_e(x) + 1 = 0$