



Transformation Graphing – Families of Functions

Make this PDF available to your students and let them decide if the videos are of help to them.

Here is the link to the PDF: bit.ly/QRGf2026

Download it and save it on your desktop for quick access.

Pick the video, click on its link.

And view it.

(do not print the PDF, it is made to be used online)

250+ Video Series For students ... and teachers!

16 of the most common “parent” functions – see the list at the right.

Each parent function is also graphed at least 13 more times using common transformations.

Take a quick look at the various examples for the parent functions and their transformations by simply clicking on the ‘next’ area at the bottom of the displayed PDF

In the Code, a ‘P’ means this video shows how to graph this parent function as if it were the first time – very thorough.

In the Code, a “Q” means this video is a ‘Quick’ review how to graph this parent function.

Parent function	Description
	Videos that teach how to do the transformations
$Ax + By = C$ $y - y_1 = m(x - x_1)$ $x = c$ $y = mx + b$ $y = c$	Linear relations
$m = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$	What slope means and its formula
$y = x^2$	Squaring function
$y = x $	Absolute value
$y = \sqrt{x}$	Square root
$y = \frac{1}{x}$	Reciprocal
$y = x^3$	Cubic
$y = \sqrt[3]{x}$	Cube root
$y = 2^x$	2 to the x
$y = \left(\frac{1}{2}\right)^x$	One-half to the x
$y = e^x$	e to the x
$y = \ln(x)$	Natural log of x
$y = \sqrt{r^2 - x^2}$	Semicircle
$y = [x]$	Greatest integer, step
$y = f(x)$	Generic piecewise
$y = \sin(x)$	Sine
$y = \cos(x)$	Cosine



Families of Functions

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Download this PDF.

Click on the YouTube link or Bitly link on the downloaded PDF to view the video.

$y = f(x)$ 00 Linear relations and Slope Link to this PDF: bit.ly/QRGfof2026

There are two links for each video: youtube.be, bit.ly:
(they are the same video with two different links)

Code	Example(s)	Now, you try.	YouTube link	Bitly link
00P	$2x + 3y = 18$	$3x - 4y = 24$	youtu.be/aSB7sf5jAyg	bit.ly/TI21fof00P
00Q	$x - 4y = 12$	$4x + 3y = 12$	youtu.be/-5T4HYMcr1o	bit.ly/TI21fof00Q
00MBP	$y = \frac{1}{2}x + 3$ $4x + 2y = 10$	$y = -\frac{3}{2}x + 1$ $3x - 5y = 15$ $10x = 4y$	youtu.be/qdvUCT1RUZQ	bit.ly/TI21fof00MBP <i>explains how to graph a line using the slope-intercept method</i>
00MBQ	$y = -\frac{2}{5}x + 4$	$y = x - 3$ $3x + 2y = 0$	youtu.be/Cr70fLMu0Wc	bit.ly/TI21fof00MBQ
00PSP	$y - 2 = 3(x - 1)$ $y - 4 = -\frac{1}{2}(x + 3)$ $y + 2 = \frac{3}{5}x$	$y + 3 = -(x + 4)$ $y = \frac{3}{2}(x - 4)$	youtu.be/8Z-pHH2jIS0	bit.ly/TI21fof00PSP
00PSQ	$y + 1 = -2(x - 5)$	$y - 4 = \frac{2}{5}(x + 3)$	youtu.be/DwVs_Z5zC98	bit.ly/TI21fof00PSQ
00PST	$y = 3(x - 2) + 5$	$y = -\frac{2}{3}(x + 1) - 4$	youtu.be/RROqum87S_8	bit.ly/TI21fof00PST
00XP	$x = 4$ $x = -3$ $x = \frac{5}{2}$	$x = 2$	youtu.be/IORu3ZXBflg	bit.ly/TI21fof00XP
00XQ	$x = -\frac{3}{2}$	$x = 0$	youtu.be/PcMdCOflkvo	bit.ly/TI21fof00XQ
00YP	$y = 5$ $y = -6$ $y = -\frac{3}{2}$	$y = 4$	youtu.be/-U8x5l6W3tA	bit.ly/TI21fof00YP
00YQ	$y = \frac{5}{2}$	$y = 0$	youtu.be/20TW8Q8qkE0	bit.ly/TI21fof00YQ



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00CS	$2x - 3y = 12$ $y = \frac{2}{3}x - 4$ $y + 2 = \frac{2}{3}(x - 3)$	n/a	youtu.be/lwgLOjoA2tY	bit.ly/TI21fof00CS
00C5	$x - 4y + 8 = 0$ $y = -\frac{1}{3}(x - 5) - 3$ $2x + 5 = 0$ $y + 5 = \frac{5}{2}x$ $3y = 12$	$y - 3 = -2(x + 1)$ $x + 4y = 8$ $4x + 14 = 2$	youtu.be/LTAmLK2EIHM	bit.ly/TI21fof00C5
	Slope Videos Below			
00M1	What slope means and the 4 “flavors” of slope	n/a	youtu.be/VNcp_CFCMnQ	bit.ly/TI21fof00M1
00M2	Calculate slope from graphs	n/a	youtu.be/j7-EkkVV3VI	bit.ly/TI21fof00M2
00M3	Calculate slope from tables	n/a	youtu.be/hFxMvVrnmGI	bit.ly/TI21fof00M3
00M4	Derive the slope formula	n/a	youtu.be/VccDvxgctsI	bit.ly/TI21fof00M4
00M5	Calculate the slope using the slope formula	n/a	youtu.be/VOR22KbmbV8	bit.ly/TI21fof00M5
00M6	Draw lines with given slope	n/a	youtu.be/tlvVkxU5rTc	bit.ly/TI21fof00M6



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$y = x^2$ **01 the squaring function** Link to this PDF: bit.ly/QRGfof2026

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(they are the same video with two different links)

Code	Example	Now, you try one.	Youtube link	Bitly link
01P	$y = x^2$ How to	N/A	youtu.be/7pz244agv1A	bit.ly/TI21fof01P
01Qr	$y = x^2$ Quick	N/A	youtube.com/MfWi79ujFus	bit.ly/TI21fof01Qr
01VAR	$y = x^2 + 1$	$y = x^2 + 3$	youtube.com/r9-F8ORpg4M	bit.ly/TI21fof01VAR
01VB	$y = x^2 - 3$	$y = x^2 - 6$	youtu.be/nLsptl8iZCk	bit.ly/TI21fof01VB
01HA	$y = (x + 6)^2$	$y = (x + 4)^2$	youtu.be/sXfKr20MLsk	bit.ly/TI21fof01HA
01HB	$y = (x - 5)^2$	$y = (x - 3)^2$	youtu.be/dGmJNc_GcLk	bit.ly/TI21fof01HB
01D	$y = 2x^2$	$y = \frac{3}{2}x^2$	youtu.be/4dHKeYa8_5Y	bit.ly/TI21fof01D
01DB	$y = \frac{1}{2}x^2$	$y = \frac{1}{3}x^2$	youtu.be/XUNH_z6TR5E	bit.ly/TI21fof01DB
01KA	$y = (3x)^2$	$y = (2x)^2$	youtu.be/7LLMRfem0XE	bit.ly/TI21fof01KA
01KB	$y = \left(\frac{1}{2}x\right)^2$	$y = \left(\frac{1}{3}x\right)^2$	youtu.be/tj8Z9HWa_E0	bit.ly/TI21fof01KB
01S	$y = -x^2$	N/A	youtu.be/tnPN-epV3zs	bit.ly/TI21fof01S
01N	$y = (-x)^2$	N/A	youtu.be/ON9PNOrdmbS	bit.ly/TI21fof01N
01CA	$y = 2x^2 - 3$	$y = \frac{1}{2}x^2 + 1$	youtu.be/P3POCYp8h9U	bit.ly/TI21fof01CA
01CB	$y = -(x + 4)^2 + 1$	$y = -(x - 2)^2 - 3$	youtu.be/0ua9o28ypRs	bit.ly/TI21fof01CB
01CC	$y = -\frac{1}{2}(x - 3)^2 + 4$	$y = -2(x + 4)^2 + 5$	youtu.be/KShf-13c1-E	bit.ly/TI21fof01CC



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$y = |x|$ **02 absolute value** Link to this PDF: bit.ly/QRGfof2026

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(they are the same video with two different links)

Code	Example	Now, you try one.	Youtube link	Bitly link
02P	$y = x $ How to	N/A	youtu.be/9GxROaJWtss	bit.ly/TI21fof02P
02Q	$y = x $ Quick	N/A	youtu.be/rmXI97nzi-M	bit.ly/TI21fof02Q
02VA	$y = x + 2$	$y = x + 5$	youtu.be/x0PF-imxzdA	bit.ly/TI21fof02VA
02VB	$y = x - 4$	$y = x - 3$	youtu.be/PpQ-3JIB1yQ	bit.ly/TI21fof02VB
02HA	$y = x + 4 $	$y = x + 5 $	youtu.be/Rk2CLqI3aUY	bit.ly/TI21fof02HA horizontal shift
02HB	$y = x - 6 $	$y = x - 3 $	youtu.be/FVoLLYQ8NEY	bit.ly/TI21fof02HB
02D	$y = 3 x $	$y = 4 x $	youtu.be/nwbMIO9VnGg	bit.ly/TI21fof02D
02DB	$y = \frac{1}{2} x $	$y = \frac{1}{4} x $	youtu.be/VV8LSBmh78I	bit.ly/TI21fof02DB
02KAr	$y = 4x $	$y = 3x $	youtube.com/EhYC-i-QABM	bit.ly/TI21fof02KAr
02KBr	$y = \left \frac{1}{3}x\right $	$y = \left \frac{1}{2}x\right $	youtube.com/V-BQyPyqUbg	bit.ly/TI21fof02KBr
02S	$y = - x $	N/A	youtu.be/hoRhT-yOkss	bit.ly/TI21fof02S
02N	$y = -x $	N/A	youtu.be/lV960lwtpLE	bit.ly/TI21fof02N
02CA	$y = \frac{1}{2} x + 3$	$y = 3 x - 4$	youtu.be/0BXcEJwC_d8	bit.ly/TI21fof02CA
02CB	$y = - x - 5 + 1$	$y = - x + 3 - 2$	youtu.be/WmKZYqoLSM4	bit.ly/TI21fof02CB
02CC	$y = \left \frac{1}{2}x + 3\right - 4$	$y = 2x - 4 - 5$	youtu.be/Hei6kBb-Rns	bit.ly/TI21fof02CC



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$y = \sqrt{x}$ **03 square root of x** Link to this PDF: bit.ly/QRGfof2026

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Code	Example	Now, you try one.	Youtube link	Bitly link
03P	$y = \sqrt{x}$ How to	N/A	youtu.be/X8Qzvu-v_RE	bit.ly/TI21fof03P
03Q	$y = \sqrt{x}$ Quick	N/A	youtu.be/VQCkk37S9Mo	bit.ly/FoF21fof03Q
03VA	$y = \sqrt{x} + 3$	$y = \sqrt{x} + 1$	youtu.be/gyu-ABlh0xE	bit.ly/TI21fof03VA
03VB	$y = \sqrt{x} - 5$	$y = \sqrt{x} - 2$	youtu.be/SvyP_EKcZlw	bit.ly/TI21fof03VB
03HA	$y = \sqrt{x + 6}$	$y = \sqrt{x + 3}$	youtu.be/GwSVcLyf17E	bit.ly/TI21fof03HA
03HB	$y = \sqrt{x - 2}$	$y = \sqrt{x - 5}$	youtu.be/tdFR3nDIEO8	bit.ly/TI21fof03HB
03DA	$y = \frac{3}{2}\sqrt{x}$	$y = 3\sqrt{x}$	youtu.be/fjvFV7JrjnE	bit.ly/TI21fof03DA <i>dilation</i>
03DB	$y = \frac{1}{2}\sqrt{x}$	$y = \frac{1}{3}\sqrt{x}$	youtu.be/116oAq89VYE	bit.ly/TI21fof03DB
03KAr	$y = \sqrt{4x}$	$y = \sqrt{3x}$	youtube.com/cv6Vo0A3qgxg	bit.ly/TI21fof03KAr
03KBr	$y = \sqrt{\frac{1}{2}x}$	$y = \sqrt{\frac{1}{3}x}$	youtube.com/HqmGetSac6Q	bit.ly/TI21fof03KBr
03S	$y = -\sqrt{x}$	N/A	youtu.be/7yfPCCNCz9w	bit.ly/TI21fof03S
03N	$y = \sqrt{-x}$	N/A	youtu.be/DOvpolqjltM	bit.ly/TI21fof03N
03CA	$y = 2\sqrt{x} + 3$	$y = \frac{3}{2}\sqrt{x} + 2$	youtu.be/E31sZBcqoPl	bit.ly/TI21fof03CA
03CB	$y = \sqrt{2x} - 4$	$y = \sqrt{\frac{1}{2}x} + 2$	youtu.be/PtaV1OtsJ-k	bit.ly/TI21fof03CB
03CC	$y = -\frac{1}{2}\sqrt{x + 6} + 1$	$y = -2\sqrt{x - 3} - 4$	youtu.be/qmG5-gFYnBM	bit.ly/TI21fof03CC



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$$y = \frac{1}{x}$$

04 reciprocal function

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Code	Example	Now, you try one.	Youtube link	Bitly link
04P	$y = \frac{1}{x}$ (1 & 2) How to	N/A	youtu.be/SJORO13Dcqk youtu.be/ixw4KxmX-DI	bit.ly/TI21fof04P1 bit.ly/TI21fof04P2
04Q	$y = \frac{1}{x}$ Quick	N/A	youtu.be/tbnJphkaBf8	bit.ly/TI21fof04Q
04VA	$y = \frac{1}{x} + 2$	$y = \frac{1}{x} + 4$	youtu.be/LfPuWxFu_WQ	bit.ly/TI21fof04VA
04VB	$y = \frac{1}{x} - 3$	$y = \frac{1}{x} - 2$	youtu.be/XRUUVcjkelnE	bit.ly/TI21fof04VB
04HA	$y = \frac{1}{x+3}$	$y = \frac{1}{x+1}$	youtu.be/9Cmgj5oVXdk	bit.ly/TI21fof04HA
04HB	$y = \frac{1}{x-2}$	$y = \frac{1}{x-4}$	youtu.be/JfFQWmtdN6k	bit.ly/TI21fof04HB
04DA	$y = \frac{3}{x} = 3 \cdot \frac{1}{x}$	$y = \frac{4}{x} = 4 \cdot \frac{1}{x}$	youtu.be/pw3NRWHlgys	bit.ly/TI21fof04DA
04DB	$y = \frac{1}{2x} = \frac{1}{2} \cdot \frac{1}{x}$	$y = \frac{1}{3x} = \frac{1}{3} \cdot \frac{1}{x}$	youtu.be/wsiKGPj1bP4	bit.ly/TI21fof04DB
04KAr	$y = \frac{1}{(2x)}$	$y = \frac{1}{(3x)}$	youtube.com/1tPK13dUyZg	bit.ly/TI21fof04KAr
04KBr	$y = \frac{1}{\left(\frac{1}{2}x\right)}$	$y = \frac{1}{\left(\frac{1}{3}x\right)}$	youtube.com/NAGWGv34_ZM	bit.ly/TI21fof04KBr
04S	$y = -\frac{1}{x}$	N/A	youtu.be/sfhll7JeAOM	bit.ly/TI21fof04S opposite of function
04N	$y = \frac{1}{(-x)}$	N/A	youtu.be/Gm6Ovq4DTEI	bit.ly/TI21fof04N
04CAr2	$y = \frac{1}{x-1} + 2$	$y = \frac{1}{x+3} - 5$	youtube.com/xMOPE_tf9zc	bit.ly/TI21fof04CAr2
04CB	$y = -\frac{6}{x}$	$y = \frac{8}{x}$	youtu.be/BbhBXHCx1J4	bit.ly/TI21fof04CB
04CCr	$y = -\frac{1}{x+4} - 2$	$y = -\frac{1}{x-5} + 3$	youtube.com/X-52xWfFsQQ	bit.ly/TI21fof04CCr



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$y = x^3$ **05 cubic function** Link to this PDF: bit.ly/QRGfof2026

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(they are the same video with two different links)

Code	Example	Now, you try one.	Youtube link	Bitly link
05P	$y = x^3$ How to	N/A	youtu.be/PkCWOCznBFg	bit.ly/TI21fof05P
05Q	$y = x^3$ Quick	N/A	youtu.be/4GKgnQb4GVg	bit.ly/TI21fof05Q
05VA	$y = x^3 + 1$	$y = x^3 + 2$	youtu.be/kUq41JYRhv0	bit.ly/TI21fof05VA
05VB	$y = x^3 - 2$	$y = x^3 - 4$	youtu.be/oZ3YoL-ca6M	bit.ly/TI21fof05VB
05HA	$y = (x + 3)^3$	$y = (x + 5)^3$	youtu.be/y40TSFKhMow	bit.ly/TI21fof05HA
05HB	$y = (x - 4)^3$	$y = (x - 2)^3$	youtu.be/_LHudsWaB3M	bit.ly/TI21fof05HB
05DA	$y = 2x^3$	$y = \frac{3}{2}x^3$	youtu.be/8bJzs2DoS_w	bit.ly/TI21fof05DA
05DB	$y = \frac{1}{2}x^3$	$y = \frac{1}{3}x^3$	youtu.be/5UyZsl7tVKQ	bit.ly/TI21fof05DB
05KA	$y = (2x)^3$	$y = (3x)^3$	youtu.be/x-grv65q8mw	bit.ly/TI21fof05KA
05KBr	$y = \left(\frac{1}{3}x\right)^3$	$y = \left(\frac{1}{2}x\right)^3$	youtube.com/uUcnZlIRyWU	bit.ly/TI21fof05KBr
05S	$y = -x^3$	N/A	youtu.be/OzDf941UFqg	bit.ly/TI21fof05S
05N	$y = (-x)^3$	N/A	youtu.be/TwjQ2DkZsHw	bit.ly/TI21fof05N opposite of x
05CA	$y = 4 - x^3$	$y = -1 - x^3$	youtu.be/IIUauv-bEYg	bit.ly/TI21fof05CA
05CBr	$y = \frac{3}{2}(x + 4)^3$	$y = 2(x - 5)^3$	youtube.com/YME2_neZ-FU	bit.ly/TI21fof05CBr
05CC	$y = -\frac{1}{2}(x - 1)^3 + 2$	$y = -\frac{3}{2}(x + 2)^3 - 1$	youtu.be/KezFvyC-S0U	bit.ly/TI21fof05CC



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$y = \sqrt[3]{x}$ **06 cube root** Link to this PDF: bit.ly/QRGfof2026

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(they are the same video with two different links)

Code	Example	Now, you try one.	Youtube link	Bitly link
06P	$y = \sqrt[3]{x}$ How to	N/A	youtu.be/Rdt1peDFbvk	bit.ly/TI21fof06P
06Q	$y = \sqrt[3]{x}$ Quick	N/A	youtu.be/Snkt8P99xYU	bit.ly/TI21fof06Q
06VA	$y = \sqrt[3]{x} + 4$	$y = \sqrt[3]{x} + 1$	youtu.be/NneFh65vT94	bit.ly/TI21fof06VA vertical shift
06VB	$y = \sqrt[3]{x} - 5$	$y = \sqrt[3]{x} - 2$	youtu.be/Pf6wB-WGC80	bit.ly/TI21fof06VB
06HA	$y = \sqrt[3]{x+3}$	$y = \sqrt[3]{x+2}$	youtu.be/X2NC1WyBPeU	bit.ly/TI21fof06HA
06HB	$y = \sqrt[3]{x-1}$	$y = \sqrt[3]{x-2}$	youtu.be/USfR6BPJ0LQ	bit.ly/TI21fof06HB
06DA	$y = 2\sqrt[3]{x}$	$y = \frac{3}{2}\sqrt[3]{x}$	youtu.be/1ByslHcVrws	bit.ly/TI21fof06DA
06DB	$y = \frac{1}{3}\sqrt[3]{x}$	$y = \frac{1}{2}\sqrt[3]{x}$	youtu.be/rf7FcXrqSSk	bit.ly/TI21fof06DB
06KAr	$y = \sqrt[3]{3x}$	$y = \sqrt[3]{2x}$	youtube.com/MGdXARSURMQ	bit.ly/TI21fof06KAr
06KBr	$y = \sqrt[3]{\frac{1}{2}x}$	$y = \sqrt[3]{\frac{1}{3}x}$	youtube.com/1k-lyeMDpvY	bit.ly/TI21fof06KBr
06S	$y = -\sqrt[3]{x}$	N/A	youtu.be/rXgjKgw8q84	bit.ly/TI21fof06S
06N	$y = \sqrt[3]{-x}$	N/A	youtu.be/Os9-tPs1oRE	bit.ly/TI21fof06N
06CAr2	$y = 2\sqrt[3]{x-1}$	$y = \frac{1}{2}\sqrt[3]{x+3}$	youtu.be/6KKVjJ9SQOI	bit.ly/TI21fof06CAr2
06CBr	$y = -\frac{3}{2}\sqrt[3]{x} + 2$	$y = -\sqrt[3]{x} - 3$	youtube.com/mP7gHSVyl2c	bit.ly/TI21fof06CBr
06CCr	$y = 2 - \sqrt[3]{x+1}$	$y = 3 + \frac{1}{2}\sqrt[3]{x-2}$	youtube.com/j9P2qmYiRhs	bit.ly/TI21fof06CCr



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$y = 2^x$ 07 2 to the x power Link to this PDF: bit.ly/QRGfof2026

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(they are the same video with two different links)

Code	Example	Now, you try one.	Youtube link	Bitly link
07P	$y = 2^x$ How to	N/A	youtu.be/t5IzFjn6AUg	bit.ly/TI21fof07P
07Qr	$y = 2^x$ Quick	N/A	youtube.com/qlWs3YiYv-A	bit.ly/TI21fof07Qr
07VA	$y = 2^x + 1$	$y = 2^x + 3$	youtu.be/FmNQX845g7Y	bit.ly/TI21fof07VA
07VB	$y = 2^x - 2$	$y = 2^x - 4$	youtu.be/8wvQPQc6_4M	bit.ly/TI21fof07VB
07HA	$y = 2^{x+3}$	$y = 2^{x+1}$	youtu.be/kW8XRfQksbg	bit.ly/TI21fof07HA
07HB	$y = 2^{x-4}$	$y = 2^{x-2}$	youtu.be/ZpMbuBDEIHs	bit.ly/TI21fof07HB
07DA	$y = 2 \cdot 2^x$	$y = \frac{3}{2} \cdot 2^x$	youtu.be/Dag8dluycpU	bit.ly/TI21fof07DA
07DB	$y = \frac{1}{3} \cdot 2^x$	$y = \frac{1}{2} \cdot 2^x$	youtu.be/hkiyJxydBaw	bit.ly/TI21fof07DB
07KAr	$y = 2^{3x}$	$y = 2^{2x}$	youtube.com/KW1i7rjlE24	bit.ly/TI21fof07KAr
07KBr	$y = 2^{\frac{1}{2}x}$	$y = 2^{\frac{1}{3}x}$	youtube.com/2HDFzLNrp-w	bit.ly/TI21fof07KBr
07S	$y = -2^x$	N/A	youtu.be/jBYysvPjp_s	bit.ly/TI21fof07S
07N	$y = 2^{-x}$	N/A	youtu.be/Dt5Rs4fsK0g	bit.ly/TI21fof07N
07CA	$y = 2^{x+1} - 3$	$y = 2^{x-2} + 1$	youtu.be/yiPX2SYfuXg	bit.ly/TI21fof07CA combination of transformations
07CB	$y = 2^{\frac{1}{2}x} + 1$	$y = 2^{2x} - 5$	youtu.be/1Q3tMm9pZ_s	bit.ly/TI21fof07CB
07CC	$y = -2^{x-2} + 4$	$y = -\frac{1}{2} \cdot 2^{x+3} - 1$	youtu.be/Oup-Q6y4k8A	bit.ly/TI21fof07CC



Families of Functions

TI PROFESSIONAL DEVELOPMENT

Go to this website: bit.ly/FoFsiteTI www.TomReardon.com

$$y = \left(\frac{1}{2}\right)^x \quad \text{08 one-half to the x power} \quad \text{Link to this PDF: } bit.ly/QRGfof2026$$

There are two links for each video: youtu.be, bit.ly:
(they are the same video with two different links)

Code	Example	Now, you try one.	Youtube link	Bitly link
08P	$y = \left(\frac{1}{2}\right)^x$ How to	N/A	youtu.be/ZI96DMHCi28	bit.ly/TI21fof08P
08Q	$y = \left(\frac{1}{2}\right)^x$ Quick	N/A	youtu.be/62XSeM0jFx0	bit.ly/TI21fof08Q
08VA	$y = \left(\frac{1}{2}\right)^x + 2$	$y = \left(\frac{1}{2}\right)^x + 4$	youtu.be/Nv7A9lYSex0	bit.ly/TI21fof08VA
08VB	$y = \left(\frac{1}{2}\right)^x - 1$	$y = \left(\frac{1}{2}\right)^x - 3$	youtu.be/8AO-ClxtRhQ	bit.ly/TI21fof08VB
08HA	$y = \left(\frac{1}{2}\right)^{x+5}$	$y = \left(\frac{1}{2}\right)^{x+2}$	youtu.be/cKCUUMrILGg	bit.ly/TI21fof08HA
08HB	$y = \left(\frac{1}{2}\right)^{x-4}$	$y = \left(\frac{1}{2}\right)^{x-1}$	youtu.be/04RXY6kJYr8	bit.ly/TI21fof08HB
08DA	$y = 3\left(\frac{1}{2}\right)^x$	$y = 4\left(\frac{1}{2}\right)^x$	youtu.be/vcyKrZP-4mw	bit.ly/TI21fof08DA
08DB	$y = \frac{1}{4}\left(\frac{1}{2}\right)^x$	$y = \frac{1}{2}\left(\frac{1}{2}\right)^x$	youtu.be/bu9iMtvoRkQ	bit.ly/TI21fof08DB
08KA	$y = \left(\frac{1}{2}\right)^{2x}$	$y = \left(\frac{1}{2}\right)^{3x}$	youtu.be/MBDISOhgm1I	bit.ly/TI21fof08KA horizontal shrink
08KB	$y = \left(\frac{1}{2}\right)^{\frac{1}{3}x}$	$y = \left(\frac{1}{2}\right)^{\frac{1}{2}x}$	youtu.be/H1EwfjJISBQ	bit.ly/TI21fof08KB
08S	$y = -\left(\frac{1}{2}\right)^x$	N/A	youtu.be/kgiUtoy4jul	bit.ly/TI21fof08S
08N	$y = \left(\frac{1}{2}\right)^{-x}$	N/A	youtu.be/1BD_4hgJp4Y	bit.ly/TI21fof08N
08CA	$y = \left(\frac{1}{2}\right)^{x-2} + 1$	$y = \left(\frac{1}{2}\right)^{x+3} - 2$	youtu.be/sui5mnQVJ3I	bit.ly/TI21fof08CA



Families of Functions

TI PROFESSIONAL DEVELOPMENT

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08CB	$y = 3 - \left(\frac{1}{2}\right)^x$	$y = -2\left(\frac{1}{2}\right)^x - 1$	youtu.be/c9YgNh5Cs-U	bit.ly/TI21fof08CB
08CC	$y = \left(\frac{1}{2}\right)^{2x} - 7$	$y = \left(\frac{1}{2}\right)^{\frac{1}{2}x} + 3$	youtu.be/ldsgeO_YFMA	bit.ly/TI21fof08CC



Families of Functions

TI PROFESSIONAL DEVELOPMENT

Go to this website: bit.ly/FoFsiteTI www.TomReardon.com

$y = e^x$ **09 e to the x power** Link to this PDF: bit.ly/QRGfof2026

There are two links for each video:youtu.be, bit.ly:
(they are the same video with two different links)

Code	Example	Now, you try one.	Youtube link	Bitly link
09P	$y = e^x$ How to	N/A	youtu.be/Wv9GcFc_wCU	bit.ly/TI21fof09P
09Q	$y = e^x$ Quick	N/A	youtu.be/W1js6WbanLI	bit.ly/TI21fof09Q
09VA	$y = e^x + 1$	$y = e^x + 3$	youtu.be/LHkgjy0epqo	bit.ly/TI21fof09VA
09VB	$y = e^x - 3$	$y = e^x - 2$	youtu.be/ITDdNQdLnF0	bit.ly/TI21fof09VB
09HAr	$y = e^{x+5}$	$y = e^{x+2}$	youtube.com/kYr5HXLIYWY	bit.ly/TI21fof09HAr horizontal shift
09HBr	$y = e^{x-1}$	$y = e^{x-4}$	youtube.com/vOpQvH1iZU4	bit.ly/TI21fof09HBr
09DA	$y = 2 \cdot e^x$	$y = 3 \cdot e^x$	youtu.be/a_Lqj2GfAi8	bit.ly/TI21fof09DA
09DB	$y = \frac{1}{2} \cdot e^x$	$y = \frac{1}{3} \cdot e^x$	youtu.be/lfikZUHBnb0	bit.ly/TI21fof09DB
09KA	$y = e^{2x}$	$y = e^{3x}$	youtu.be/3UoBqeuKgms	bit.ly/TI21fof09KA
09KB	$y = e^{\frac{1}{3}x}$	$y = e^{\frac{1}{2}x}$	youtu.be/xCWcW5VtNyc	bit.ly/TI21fof09KB
09Sr	$y = -e^x$	N/A	youtube.com/3-ewqeKMmgs	bit.ly/TI21fof09Sr
09N	$y = e^{-x}$	N/A	youtu.be/04upOPXxVRc	bit.ly/TI21fof09N
09CA	$y = e^{x-2} - 4$	$y = e^{x+3} + 2$	youtu.be/AEsPIY51XA8	bit.ly/TI21fof09CA
09CB	$y = e^{2x} - 1$	$y = e^{\frac{1}{2}x} + 2$	youtu.be/CSGeFiK3DpU	bit.ly/TI21fof09CB
09CC	$y = \frac{1}{2}e^{x-3} + 1$	$y = 2e^{x+4} - 6$	youtu.be/rexpaRvj5AE	bit.ly/TI21fof09CC



Families of Functions

TI PROFESSIONAL DEVELOPMENT

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$y = \ln(x)$ 10 natural log Link to this PDF: bit.ly/QRGfof2026

There are two links for each video: youtu.be, bit.ly:
(they are the same video with two different links)

Code	Example	Now, you try one.	Youtube link	Bitly link
10P	$y = \ln(x)$ How to	N/A	youtu.be/XdQ68p7qqE8	bit.ly/TI21fof10P <i>how to graph</i>
10Q	$y = \ln(x)$ Quick	N/A	youtu.be/qt2RYdPtOAE	bit.ly/TI21fof10Q
10VA	$y = \ln(x) + 2$	$y = \ln(x) + 3$	youtu.be/YC9QMkK5DLI	bit.ly/TI21fof10VA
10VB	$y = \ln(x) - 4$	$y = \ln(x) - 2$	youtu.be/OmeALYL2Eqs	bit.ly/TI21fof10VB
10HAr	$y = \ln(x + 4)$	$y = \ln(x + 2)$	youtube.com/UcJH1svHzEA	bit.ly/TI21fof10HAr
10HB	$y = \ln(x - 3)$	$y = \ln(x - 1)$	youtu.be/6klYsOFTJAY	bit.ly/TI21fof10HB
10DAr	$y = 3 \ln(x)$	$y = 2 \ln(x)$	youtube.com/npensR-KHUu4	bit.ly/TI21fof10DAr
10DB	$y = \frac{1}{3} \ln(x)$	$y = \frac{1}{2} \ln(x)$	youtu.be/qXw0DFMJo0E	bit.ly/TI21fof10DB
10KA	$y = \ln(3x)$	$y = \ln(2x)$	youtu.be/0cP9MbfNxCo	bit.ly/TI21fof10KA
10KB	$y = \ln\left(\frac{1}{2}x\right)$	$y = \ln\left(\frac{1}{3}x\right)$	youtu.be/MbPtEUyFIGM	bit.ly/TI21fof10KB
10S	$y = -\ln(x)$	N/A	youtu.be/1_hpmWYXTQc	bit.ly/TI21fof10S
10N	$y = \ln(-x)$	N/A	youtu.be/HjZF9qrTF5A	bit.ly/TI21fof10N
10CAr	$y = 2 \ln(x) - 3$	$y = \frac{1}{2} \ln(x) + 4$	youtube.com/ek9PJiADDDo	bit.ly/TI21fof10CAr
10CB	$y = \ln(x + 1) + 2$	$y = \ln(x - 3) - 2$	youtu.be/5wrL7cKuikk	bit.ly/TI21fofCB
10CC	$y = -\ln\left(\frac{1}{2}x\right)$	$y = 1 - \ln\left(\frac{1}{3}x\right)$	youtu.be/RGM2WkKjZVg	bit.ly/TI21fof10CC



Families of Functions

TI PROFESSIONAL DEVELOPMENT

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$$y = \sqrt{r^2 - x^2}$$

11 semicircle

Link to this PDF: bit.ly/QRGfof2026

There are two links for each video: youtu.be, bit.ly:

(they are the same video with two different links)

Code	Example	Now, you try one.	Youtube link	Bitly link
11P	$y = \sqrt{r^2 - x^2}$ How to	Examples: $y = \sqrt{25 - x^2}$ $y = \sqrt{36 - x^2}$ $y = \sqrt{16 - x^2}$	youtu.be/Uh8WGXzCcYI	bit.ly/TI21fof11P
11Q	$y = \sqrt{36 - x^2}$ Quick	N/A	youtu.be/trLJdDUiTEg	bit.ly/TI21fof11Q
11VA	$y = \sqrt{49 - x^2} + 2$	$y = \sqrt{36 - x^2} + 3$	youtu.be/SRA3scrh2t8	bit.ly/TI21fof11VA
11VB	$y = \sqrt{49 - x^2} - 6$	$y = \sqrt{25 - x^2} - 4$	youtu.be/7dL5D7flPHs	bit.ly/TI21fof11VB
11HA	$y = \sqrt{49 - (x + 3)^2}$	$y = \sqrt{64 - (x + 2)^2}$	youtu.be/l_FB2SamXY8	bit.ly/TI21fof11HA
11HB	$y = \sqrt{36 - (x - 4)^2}$	$y = \sqrt{25 - (x - 3)^2}$	youtu.be/6JnZmD8PWzU	bit.ly/TI21fof11HB
11DA	$y = \frac{3}{2}\sqrt{36 - x^2}$	$y = 2\sqrt{25 - x^2}$	youtu.be/4CEUteNfaZA	bit.ly/TI21fof11DA dilation
11DB	$y = \frac{1}{3}\sqrt{81 - x^2}$	$y = \frac{1}{4}\sqrt{64 - x^2}$	youtu.be/dx73ZLppDI4	bit.ly/TI21fof11DB
11KA	$y = \sqrt{36 - (2x)^2}$	$y = \sqrt{36 - (3x)^2}$	youtu.be/YpcU8ZGAfq4	bit.ly/TI21fof11KA
11KB	$y = \sqrt{25 - \left(\frac{1}{3}x\right)^2}$	$y = \sqrt{25 - \left(\frac{1}{2}x\right)^2}$	youtu.be/yc3pLcv5FKo	bit.ly/TI21fof11KB
11S	$y = -\sqrt{49 - x^2}$	N/A	youtu.be/kZs-SXloFWQ	bit.ly/TI21fof11S
11N	$y = \sqrt{36 - (-x)^2}$	N/A	youtu.be/HhNiiUT8eD8	bit.ly/TI21fof11N
11CA	$y = 2\sqrt{25 - x^2} - 3$	$y = 3\sqrt{4 - x^2} + 1$	youtu.be/35e4PYU39pU	bit.ly/TI21fof11CA
11CB	$y = -\sqrt{36 - (x + 2)^2}$	$y = -2\sqrt{9 - (x - 4)^2}$	youtu.be/QKbNlyJ-s60	bit.ly/TI21fof11CB
11CC	$y = \frac{1}{2}\sqrt{64 - (x - 1)^2} + 2$	$y = \frac{3}{2}\sqrt{16 - (x + 2)^2} - 1$	youtu.be/qZmhRLgeDfo	bit.ly/TI21fof11CC



Families of Functions

TI PROFESSIONAL DEVELOPMENT

Go to this website: bit.ly/FoFsiteTI www.TomReardon.com

$y = [x]$ 12 greatest integer (step) function Link to this PDF: bit.ly/QRGfof2026

There are two links for each video: youtube.be, bit.ly:
(they are the same video with two different links)

Code	Example	Now, you try one.	Youtube link	Bitly link
12P	$y = [x]$ How to	N/A	youtu.be/BZxMJ4EwNO0	bit.ly/TI21fof12P
12Q	$y = [x]$ Quick	N/A	youtu.be/4ABu68N05Es	bit.ly/TI21fof12Q quick review
12VA	$y = [x] + 3$	$y = [x] + 5$	youtu.be/z7hj7Mmj32g	bit.ly/TI21fof12VA
12VB	$y = [x] - 4$	$y = [x] - 2$	youtu.be/1E2AkuWZ16g	bit.ly/TI21fof12VB
12HA	$y = [x + 4]$	$y = [x + 1]$	youtu.be/RMfblEioCVc	bit.ly/TI21fof12HA
12HB	$y = [x - 3]$	$y = [x - 2]$	youtu.be/l7Y7Ke8Oyk8	bit.ly/TI21fof12HB
12DA	$y = 3[x]$	$y = 5[x]$	youtu.be/G1-qCdKnB9U	bit.ly/TI21fof12DA
12DB	$y = \frac{1}{2}[x]$	$y = \frac{1}{3}[x]$	youtu.be/LRLajTVzxil	bit.ly/TI21fof12DB
12KA	$y = [3x]$	$y = [2x]$	youtu.be/666NYPa6N8Q	bit.ly/TI21fof12KA
12KB	$y = \left[\frac{1}{2}x \right]$	$y = \left[\frac{1}{3}x \right]$	youtu.be/x8CJjnY_Xpl	bit.ly/TI21fof12KB
12S	$y = -[x]$	N/A	youtu.be/tXbNhhqhFo0	bit.ly/TI21fof12S
12N	$y = [-x]$	N/A	youtu.be/LroQozmd71l	bit.ly/TI21fof12N
12CA	$y = 2[x] + 1$	$y = \frac{3}{2}[x] - 2$	youtu.be/f3nXCyqZxoA	bit.ly/TI21fof12CA
12CB	$y = -\left[\frac{1}{2}x \right]$	$y = -2\left[\frac{1}{3}x \right]$	youtu.be/OehUZcxFknU	bit.ly/TI21fof12CB
12CC	$y = -\frac{3}{2}[x - 2] + 3$	$y = \frac{5}{2}[x + 1] - 2$	youtu.be/zYHDDw3bfIE	bit.ly/TI21fof12CC



Families of Functions

TI PROFESSIONAL DEVELOPMENT

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$y = f(x)$ 13 generic, piecewise function Link to this PDF: bit.ly/QRGfof2026

There are two links for each video:youtu.be, bit.ly:
(they are the same video with two different links)

Code	Example	Now, you try one.	Youtube link	Bitly link
13P	N/A	N/A		
13Q	N/A	N/A		
13VA	$y = f(x) + 3$	$y = f(x) + 5$	youtu.be/HeHeZMbDNnM	bit.ly/TI21fof13VA
13VB	$y = f(x) - 4$	$y = f(x) - 2$	youtu.be/eDXO4hTVsHA	bit.ly/TI21fof13VB
13HA	$y = f(x + 4)$	$y = f(x + 2)$	youtu.be/-M5g0W4tV-w	bit.ly/TI21fof13HA
13HB	$y = g(x - 5)$	$y = g(x - 3)$	youtu.be/YIBC_0-Kq1w	bit.ly/TI21fof13HB
13DA	$y = 3f(x)$	$y = \frac{3}{2}f(x)$	youtu.be/VQ1W2ZcE1JM	bit.ly/TI21fof13DA
13DB	$y = \frac{1}{3}f(x)$	$y = \frac{1}{2}f(x)$	youtu.be/vmmQnkBTPrg	bit.ly/TI21fof13DB
13KA	$y = f(3x)$	$y = f(2x)$	youtu.be/EM_z56L3r8Q	bit.ly/TI21fof13KA
13KB	$y = f\left(\frac{1}{2}x\right)$	$y = f\left(\frac{1}{3}x\right)$	youtu.be/zCGIAYee1GY	bit.ly/TI21fof13KB
13S	$y = -f(x)$	N/A	youtu.be/BYaE-6N1ewg	bit.ly/TI21fof13S opposite
13NA	$y = f(-x)$	N/A	youtu.be/4ojK3xSg6fM	bit.ly/TI21fof13NA
13CA	$y = 3f(x) + 2$	$y = 2g(x) - 3$	youtu.be/zJ9MjE3gjrI	bit.ly/TI21fof13CA
13CB	$y = -f\left(\frac{1}{2}x\right)$	$y = -f\left(\frac{1}{3}x\right)$	youtu.be/OJYdJUvD4Cs	bit.ly/TI21fof13CB
13CC	$y = 2f(x - 3) - 4$	$y = 3g(x - 4) + 5$	youtu.be/VIL6JSC7QHM	bit.ly/TI21fof13CC



Families of Functions

TI PROFESSIONAL DEVELOPMENT

Go to this website: bit.ly/FoFsiteTI www.TomReardon.com

$y = \sin(x)$ **14 The sine function** Link to this PDF: bit.ly/QRGf2026

Code	Example	Now, you try one.	Youtube link	Bitly link
14P	$y = \sin(x)$ How to	n/a	youtu.be/7grdc5MNIIU	bit.ly/TI21fof14P
14Q	$y = \sin(x)$ Quick	n/a	youtu.be/NXpHckaoOs4	bit.ly/TI21fof14Q
14VA	$y = \sin(x) + 1$	$y = \sin(x) + 2$	youtu.be/Des52ojvwz0	bit.ly/TI21fof14VA
14VB	$y = \sin(x) - 3$	$y = \sin(x) - 1$	youtu.be/9ODPdoAmWnc	bit.ly/TI21fof14VB
14HA	$y = \sin\left(x + \frac{\pi}{4}\right)$	$y = \sin\left(x + \frac{\pi}{3}\right)$	youtu.be/s3wqPXi3dTc	bit.ly/TI21fof14HA horizontal shift
14HB	$y = \sin\left(x - \frac{2\pi}{3}\right)$	$y = \sin\left(x - \frac{3\pi}{4}\right)$	youtu.be/dsbbik-TayA	bit.ly/TI21fof14HB
14DA	$y = \frac{5}{2}\sin(x)$	$y = 4\sin(x)$	youtu.be/msYTArYdBlc	bit.ly/TI21fof14DA
14DB	$y = \frac{2}{3}\sin(x)$	$y = \frac{1}{2}\sin(x)$	https://youtu.be/h6zY4mauyIY	bit.ly/TI21fof14DB
14KA	$y = \sin(3x)$	$y = \sin(4x)$	youtu.be/NWcUKjEzljM	bit.ly/TI21fof14KA
14KB	$y = \sin\left(\frac{1}{2}x\right)$	$y = \sin\left(\frac{1}{3}x\right)$	youtu.be/wqO74p5SplM	bit.ly/TI21fof14KB
14KC	$y = \sin\left(\frac{\pi}{2}x\right)$	$y = \sin\left(\frac{\pi}{3}x\right)$	youtu.be/tcQd6Oyrw9s	bit.ly/TI21fof14KC
14S	$y = -\sin(x)$	$y = \pm 3\sin(x) - 1$ $y = \pm \frac{3}{2}\sin(x) + 2$	youtu.be/dlSo2WkZIUo	bit.ly/TI21fof14S
14N	$y = \sin(-x)$	N/A	youtu.be/uCpK8hR_Eyk	bit.ly/TI21fof14N
14CA	$y = \pm \frac{5}{2}\sin(x) - 2$	$y = \pm 3\sin(x) + 1$	youtu.be/onBp2vvTIO4	bit.ly/TI21fof14CA
14CB	$y = \sin\left(2x - \frac{\pi}{3}\right)$	$y = \sin\left(\frac{1}{3}x + \frac{\pi}{6}\right)$	youtu.be/4r5a5cu3Pyw	bit.ly/TI21fof14CB
14CC	$y = \frac{3}{2}\sin\left(\frac{1}{3}x - \frac{\pi}{2}\right) - 1$	$y = 3\sin\left(2x + \frac{\pi}{4}\right) + 1$	youtu.be/kwhnl9b3nWE	bit.ly/TI21fof14CC
14CD	$y = -2\sin\left(\frac{\pi}{2}x + \frac{\pi}{4}\right) + 1$	$y = -3\sin\left(\pi x - \frac{\pi}{2}\right) - 2$	youtu.be/oo-Ezvl4ILM	bit.ly/TI21fof14CD



Families of Functions

TI PROFESSIONAL DEVELOPMENT

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$y = \cos(x)$ **15 The cosine function** Link to this PDF: bit.ly/QRGf2026

Code	Example	Now, you try one.	Youtube link	Bitly link
15P	$y = \cos(x)$ How to	n/a	youtu.be/MxFwexnOk3w	bit.ly/TI21fof15P
15Q	$y = \cos(x)$ Quick	n/a	youtu.be/fJ8GB7Jc6mg	bit.ly/TI21fof15Q
15VA	$y = \cos(x) + 2$	$y = \cos(x) + 3$	youtu.be/eB69cvqO8qo	bit.ly/TI21fof15VA vertical shift
15VB	$y = \cos(x) - 3$	$y = \cos(x) - 1$	youtu.be/yAZFe4cJcyg	bit.ly/TI21fof15VB
15HA	$y = \cos\left(x + \frac{\pi}{3}\right)$	$y = \cos\left(x + \frac{\pi}{4}\right)$	youtu.be/6i_R8GfMapc	bit.ly/TI21fof15HA
15HB	$y = \cos\left(x - \frac{\pi}{4}\right)$	$y = \cos\left(x - \frac{\pi}{3}\right)$	youtu.be/Ybbd64fNuUw	bit.ly/TI21fof15HB
15DA	$y = 3\cos(x)$	$y = \frac{3}{2}\cos(x)$	youtu.be/F0bS5IKW4dk	bit.ly/TI21fof15DA
15DB	$y = \frac{1}{2}\cos(x)$	$y = \frac{3}{4}\cos(x)$	https://youtu.be/hT7e0YVPkDE	bit.ly/TI21fof15DB
15KA	$y = \cos(3x)$	$y = \cos(2x)$	youtu.be/H19R3RFWX6U	bit.ly/TI21fof15KA
15KB	$y = \cos\left(\frac{1}{2}x\right)$	$y = \cos\left(\frac{1}{3}x\right)$	youtu.be/WxwoDYVEEO0	bit.ly/TI21fof15KB
15KC	$y = \cos(\pi x)$	$y = \cos\left(\frac{\pi}{3}x\right)$	youtu.be/w1iW7a4VaYU	bit.ly/TI21fof15KC
15S	$y = -\cos(x)$	$y = \pm \cos(x) - 2$ $y = \pm 2\cos(x) - 1$ $y = \pm 3\cos(x) + 1$	youtu.be/z7rexQA113c	bit.ly/TI21fof15S
15N	$y = \cos(-x)$	n/a	youtu.be/oyt-X00litQ	bit.ly/TI21fof15N
15CA	$y = \pm 3\cos(x) - 1$	$y = \pm 2\cos(x) + 3$	youtu.be/wK93d0D4eSY	bit.ly/TI21fof15CA
15CB	$y = -4\cos(3x) + 1$	$y = \pm 3\cos\left(\frac{1}{2}x\right) - 1$	youtu.be/AXq1K1bH4LI	bit.ly/TI21fof15CB
15CC	$y = 3\cos\left(\frac{1}{2}x + \frac{\pi}{3}\right) + 2$	$y = 2\cos\left(3x - \frac{\pi}{4}\right) - 3$	youtu.be/zrkhOQbshp4	bit.ly/TI21fof15CC
15CD	$y = \frac{5}{2}\cos\left(\frac{\pi}{3}x + \pi\right) - 1$	$y = 3\cos\left(\frac{\pi}{4}x - \frac{\pi}{2}\right) + 2$	youtu.be/WwgTuuvvecw	bit.ly/TI21fof15CD