Pre-Calculus Summer Work Name_____
Larson Pre- Calculus Chapter 1

Domain of Functions
Video to help: https://www.youtube.com/watch?v=ZxrMrWy1drc

Find the Domain of the following functions:

1. f(x) = $\frac{2+x}{x-3}$

2. $f(x)=\sqrt{x-3}$

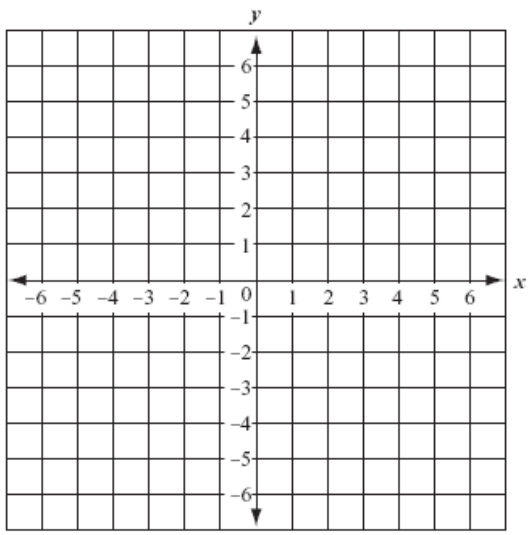
Parent Graphs and Transformations

Video to help: https://www.youtube.com/watch?v=69-1p1iowXk

Graph the 4 parent graphs AND the transformations.

Parent Graphs	Transformation
3. $y=x^2$	$y=(x+3)^2-2$
4. $y=\lvert x\rvert$	$y=-2\lvert x-1\rvert$
5. $y=\frac{1}{x}$	$y=\frac{3}{x+2}$
6. $\sqrt{x}$	$y=\frac{1}{2}\sqrt{x+3}$

3.



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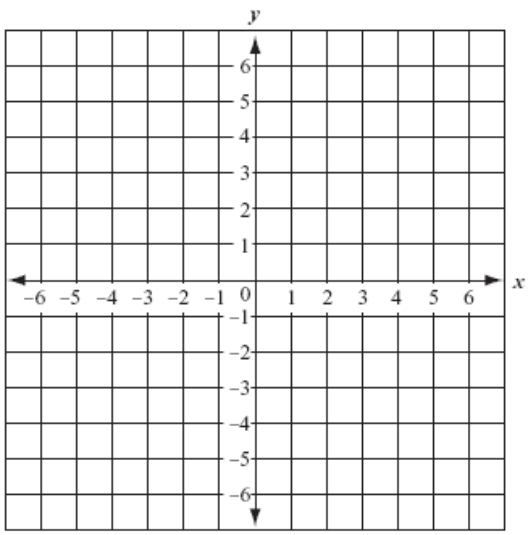
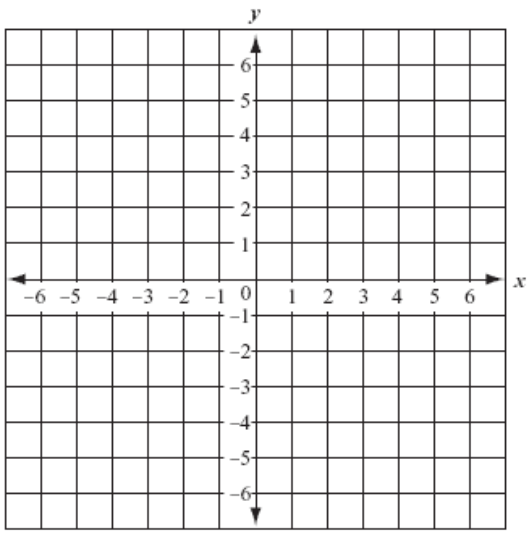
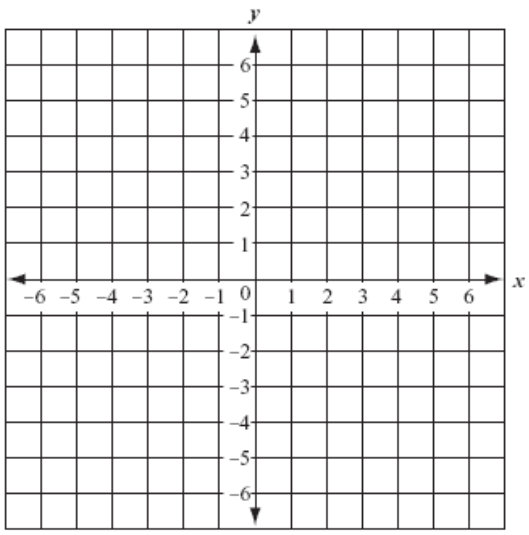


5. 

6. 

Combinations of Functions

Video to help: https://www.youtube.com/watch?v=I8Iul0Om-t4

7. If $f(x)=x^2+1$ and $g(x)=x-10$, find

a) $(f+g)(x)$

b) (f-g)(x)

c) (fg)(x)

d) (f/g)(x)

Now find the domain of all 4 new functions.

a)

b)

c)

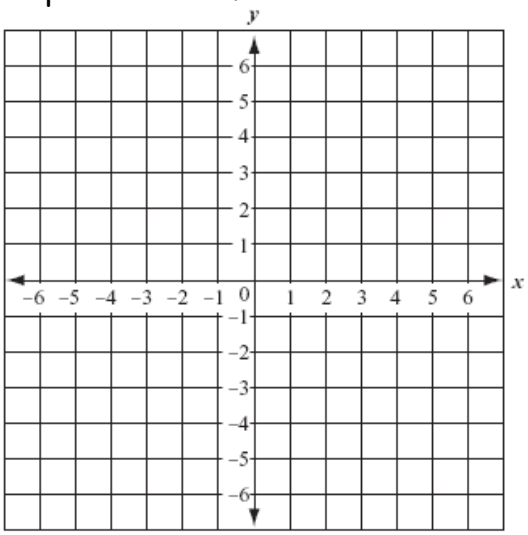
d)

The Inverse of a Function

Video to help: https://www.youtube.com/watch?v=gXIRspXL6oc

8. Find the inverse of the function $f(x) = x^3 + 2$.

Graph both the function and its inverse.



Factoring

Video to help: https://www.youtube.com/watch?v=HvBiJ9W00Z4

9. Factor:

$x^2 - 9$

$x^2 - 2x - 24$

$3x^2 + 11x + 6$

The Quadratic Formula

Video to help: https://www.youtube.com/watch?v=-gwz6d9NYz0

10. Solve using the quadratic formula $2x^2 + 5x = 4$

11. Solve using the quadratic formula $3x^2 + 2x + 5 = 0$

Composition of functions
Video to help
https://www.youtube.com/watch?v=T6-Zdr5w_bE

Practice Problems
12. Given $f(x) = 2x^2 - 4$ and $g(x) = x - 3$, find

a.) $f(g(x))$

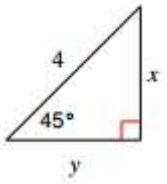
b.) $(g \circ f)(x)$

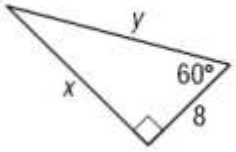
c.) $g(f(-3))$

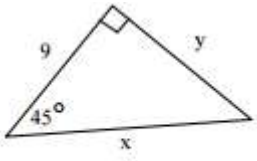
Answers
a.) $2x^2 - 12x + 14$
b.) $2x^2 - 7$
c.) 11

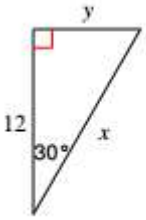
Special Right Triangles, 45-45-90 and 30-60 90
Video to help
https://www.youtube.com/watch?v=7B1yrRLSRT8

13. Find the missing sides in each of the following triangles







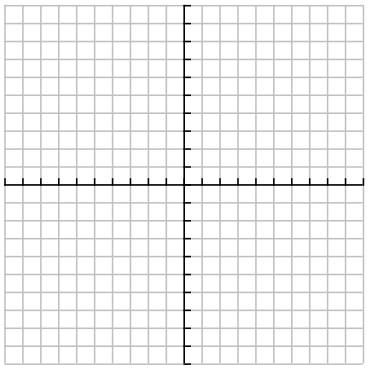


Answers

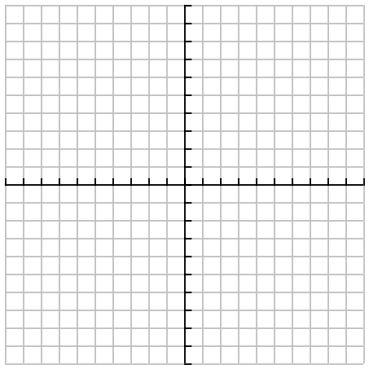
$x = 2\sqrt{2}$	$x = 8\sqrt{3}$	$x = 9\sqrt{2}$	$x = 8\sqrt{3}$
$y = 2\sqrt{2}$	$y = 16$	$y = 9$	$y = 4\sqrt{3}$

Graph a line from slope intercept form.
Video to help
https://www.youtube.com/watch?v=WQyvskZSCJg

14. Graph $y = \frac{2}{3}x - 1$

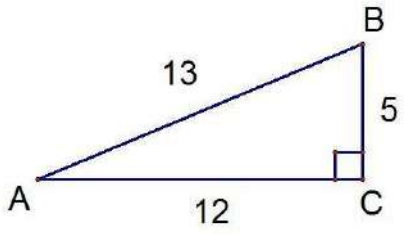


15. $y = -3x + 4$



Right Triangle Trig –

SOHCAHTOA
Video to help
https://www.youtube.com/watch?v=VRz2d5yedsg



Given ΔABC

16. Find $\sin A$ $\sin B$

17. Find $\cos A$ $\cos B$

18. Find $\tan A$ $\tan B$

Graphing Piece-Wise Functions:

Video to help: https://www.youtube.com/watch?v=GtyfOxCB0kc

Evaluate each piecewise function for $x = -8$ and $x = 5$.

1. $f(x) = \begin{cases} 2x & \text{if } x < 0 \\ 0 & \text{if } x \geq 0 \end{cases}$

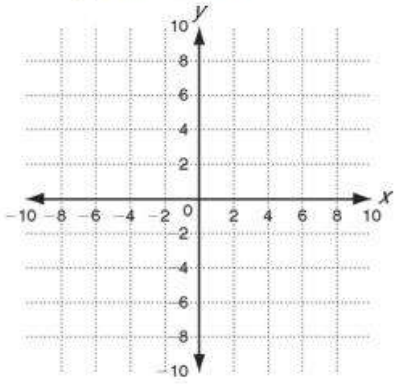
2. $g(x) = \begin{cases} 2 - x & \text{if } x \leq 5 \\ -x^2 & \text{if } 5 < x < 8 \\ 6 & \text{if } 8 \leq x \end{cases}$

3. $h(x) = \begin{cases} 2x + 4 & \text{if } x \leq -8 \\ -1 & \text{if } -8 < x < 5 \\ x^2 & \text{if } 5 \leq x \end{cases}$

4. $k(x) = \begin{cases} 15 & \text{if } x \leq -5 \\ x & \text{if } -5 < x < 1 \\ 7 - \frac{x}{2} & \text{if } 1 < x \end{cases}$

Graph each function.

5. $f(x) = \begin{cases} 6 & \text{if } x < -2 \\ 3x & \text{if } -2 \leq x \end{cases}$



6. $g(x) = \begin{cases} 12 - x & \text{if } x \leq 5 \\ x + 2 & \text{if } 5 < x \end{cases}$