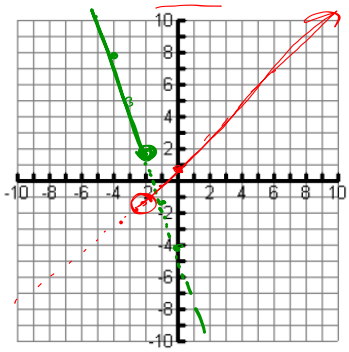
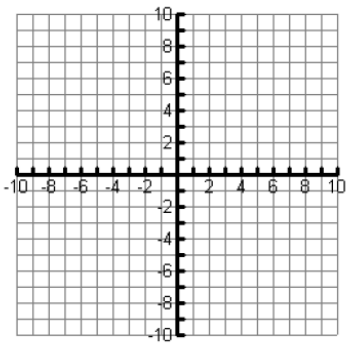
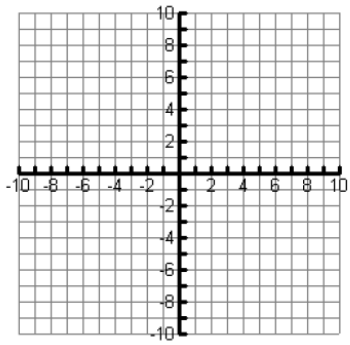
7. $f(x) = \begin{cases} -3x - 4, & x \le -2 \\ x + 1, & x > -2 \end{cases}$



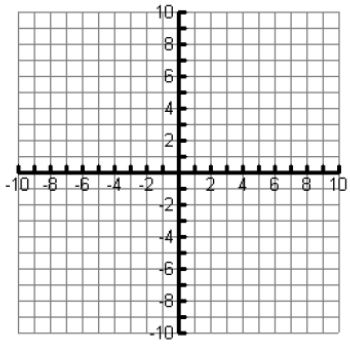
8. $f(x) = \begin{cases} -x, & x \le 0 \\ 2x - 2, & x > 0 \end{cases}$



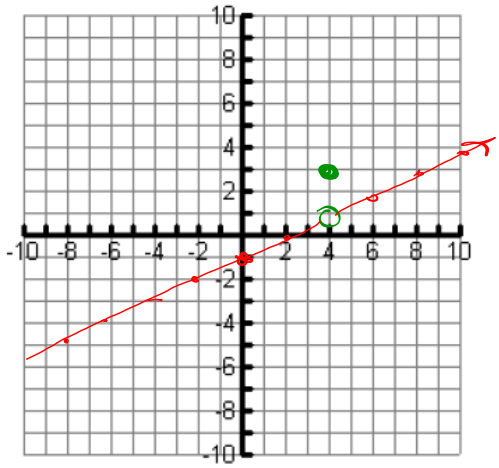
9. $f(x) = \begin{cases} -x - 4, & x < -2 \\ -\frac{1}{2}x, & -2 \le x \le 2 \\ -1, & x > 2 \end{cases}$



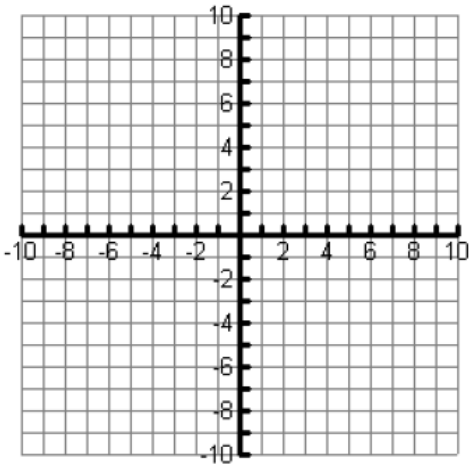
10. $f(x) = \begin{cases} 3, & x < -1 \\ x + 1, & 1 \le x \le 4 \end{cases}$



11. $f(x) = \begin{cases} \frac{1}{2}x - 1, & x \ne 4 \\ 3, & x = 4 \end{cases}$



12. $f(x) = \begin{cases} x + 4, & -6 \le x < 2 \\ -6, & x = 2 \\ -x + 2, & x > 2 \end{cases}$



4.7 More Features, More Functions

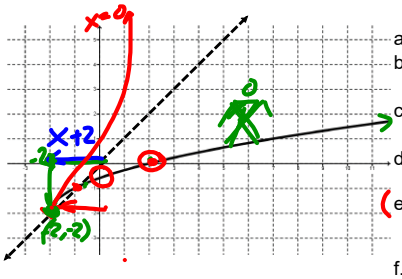
A Practice Understanding Task

Part I: Features of Functions

Find the following for each function (all graphs have a scale value of one on both the x-axis and y-axis)

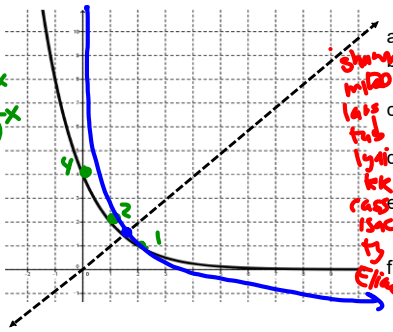
a. Equation of the function
b. Domain and range
c. Intercepts
d. Location and value of maxima/minima
e. Intervals where function is increasing or decreasing
f. Sketch the inverse of the function (on a new set of axes or overlay on the given graph)

1.



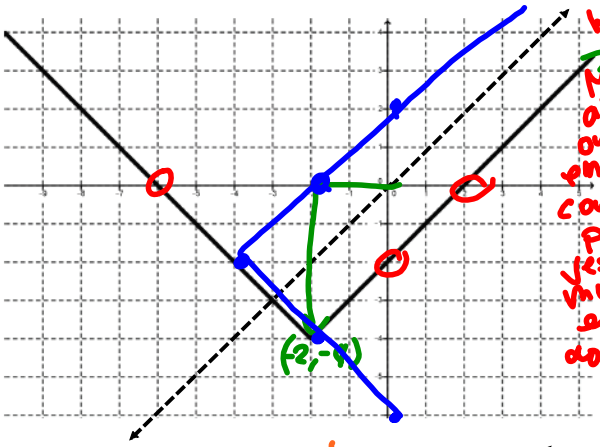
a. $y=\sqrt{x+2}-2$
b. domain $[-2,\infty)$
range $[-2,\infty)$
c. x-inter $x=2$
y-inter sub $x=0$
d. min @ $(-2,-2)$
max none
e. Inc: $(-2,\infty)$
dec:
const:
f. graph

2.



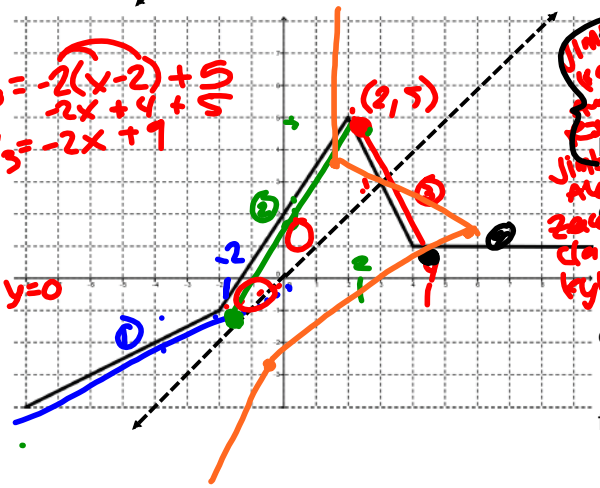
a. $y=4\left(\frac{1}{2}\right)^x$
b. domain $(-\infty,\infty)$
range $(0,\infty)$
c. x-inter none
y-inter @ $y=4$
d. min none
max none
e. Inc:
dec: $(-\infty,\infty)$
const:
f. graph

3.



a. y= $|x+2|-4$
b. domain $(-\infty,\infty)$
range $[-4,\infty)$
c. x-inter $x=-6$ & 2
y-inter $y=-2$
d. min @ $(-2,-4)$
max
e. Inc: $(-2,\infty)$
dec: $(-\infty,-2)$
const: none
f. graph

4.



a. $y_1=\frac{1}{2}x$, $x<-2$
$y_2=\frac{3}{2}x+2$, $-2\le x<2$
$y_3=-2x+9$, $2\le x<4$
$y_4=1$, $x\ge 4$
b. domain $(-\infty,\infty)$
range $(-\infty,5]$
c. x-inter sub $y=0$: $\frac{3}{2}x+2=0$, $\frac{3}{2}x=-2$, $x=-1$
y-inter @ $y=2$
d. min
max @ $(2,5)$
e. Inc: $(-\infty,2)$
dec:
const: $(2,4)$, $(4,\infty)$
f. graph

SECONDARY MATH II // MODULE 4
MORE FUNCTIONS, MORE FEATURES – 4.7

4.7

READY, SET, GO! Name Period Date

READY

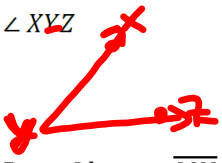
Topic: Geometric Symbols

Make a sketch that matches the geometric symbols. Label your sketch appropriately.

1. ΔRST

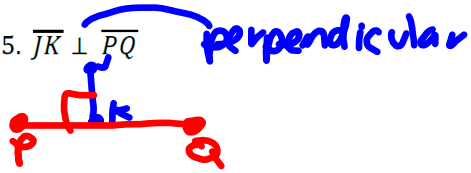
2. $\overrightarrow{AB}$

3. $\angle XYZ$



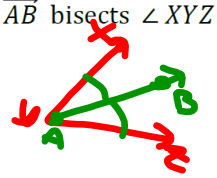
4. $\overleftrightarrow{GH}$

5. $\overline{JK} \perp \overline{PQ}$



6. Point S bisects $\overline{MN}$.

7. $\overrightarrow{AB}$ bisects $\angle XYZ$

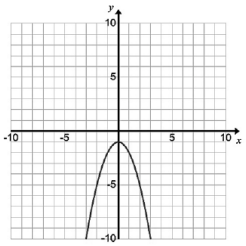


SET

Topic: Features or Functions

Find the following key features for each function:

8.



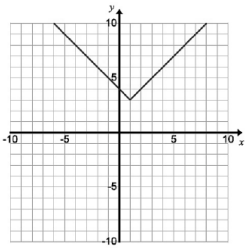
a. Domain and range

b. Intercepts

c. Location and value of maxima/minima

d. Intervals where function is increasing or decreasing

9.



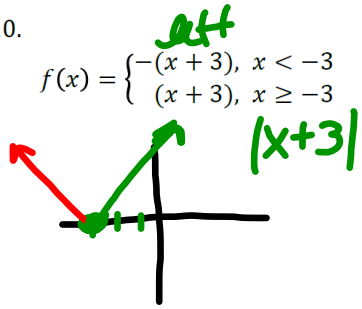
a. Domain and range

b. Intercepts

c. Location and value of maxima/minima

d. Intervals where function is increasing or decreasing

10. $f(x) = \begin{cases} -(x+3), & x < -3 \\ (x+3), & x \geq -3 \end{cases}$



a. Domain and range

b. Intercepts

c. Location and value of maxima/minima

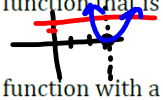
d. Intervals where function is increasing or decreasing

Write a function that meet the given requirements.

11. A function that is always decreasing

$y = -x + 2$

12. A function that is symmetrical about the line x=3



$y = (x-3)^2$

13. A function with a minimum of 5 at $x = 1$

14. A function that is increasing from $(-\infty, 2)$ then decreasing from $[2, \infty)$

15. A function with one real root x-intercept

16. A function that has a domain from $[-2, \infty)$

17. A function with a range from $[0, \infty)$

18. A function with a common factor of 2

$2(\quad) = 2x^2 + 2$

19. A function that is also a geometric sequence

20. A function with x-intercepts at (-1, 0) and (1,0)

GO

Topic: Inverse Function

→ reverse x & y
① solve
② switch

Find the inverse of each function. If the inverse is not a function, restrict the domain.

21. $f(x) = x^2; f^{-1}(x) =$

$x = \sqrt{y}$

$x = \sqrt{y}$ → $y = \sqrt{x}$, $x \geq 0$

22. $g(x) = 2x + 4; g^{-1}(x) =$

23. $f(x) = (x + 1)^2; f^{-1}(x) =$

24. $h(x) = \frac{1}{3}x + 6; h^{-1}(x) =$

25. $\boldsymbol{f(x) = \{(-3,5)(-2,-9)(-1,-2)(0,-5)(1,-4)(2,6)(3,10)(4,8)\};}$

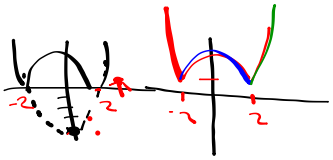
$\boldsymbol{f^{-1}(x) =}$ {(,)(,)(,)(,)(,)(,)(,)(,)}

* look HW 4.4

Write the piecewise-defined function for the following absolute value functions

26. $h(x) = |x + 3|$

27. $f(x) = |x^2 - 4| + 1$



$(x^2-4)+1 = x^2-3 \quad x<-2$

$-(x^2-4)+1 = -x^2+3 \quad -2 \le x \le 2$

$(x^2-4)+1 = x^2-3 \quad x>2$

28. $g(x) = 5|x + 3|$

29. $f(x) = |x^2 - 16|$