

S2107 Math 1314 Corbeil Test 1 2.1 to 2.6 PRACTICE

Show all work. Suggest you work out on 8 ½ x 11 sheet of paper.

Section 1: Functions, Domain, Range, Difference Quotient, Piece-Wise, Basic Functions

Let $f(x) = f(x) = 2x^2 + 3x + 5$

Find

1. $f(0)$

2. $f(-3)$

3. $f(x+h)$

4. $\frac{f(x+h)-f(x)}{h}$

Given the following piecewise defined function, find the following values:

$$f(x) = \begin{cases} \sqrt{x+2} & \text{if } x \geq -2 \\ |x-3| & \text{if } x < -2 \end{cases}$$

5. $f(2) =$

6. $f(0) =$

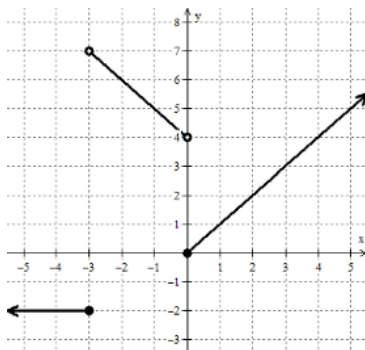
7. $f(-4) =$

8. Graph the piecewise function and State the Domain and Range. Determine the intervals where the function is increasing, decreasing or constant.

$$f(x) = \begin{cases} \sqrt{x+2} & \text{if } x \geq -2 \\ |x-3| & \text{if } x < -2 \end{cases}$$

State the Domain and Range of the function graphed below. Determine the intervals where the function is increasing, decreasing or constant.

9.



10. Find the domain and range of $f(x) = \frac{x-2}{x-4}$.

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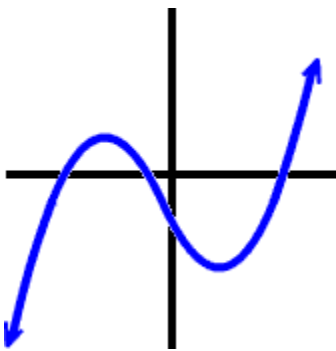
Section 2: Vertical Line Test, Even/Odd Functions Symmetry,
Increasing/decreasing, relative and global extrema

Consider the relation rule or graph below and decide if it is a function? Justify your answer.

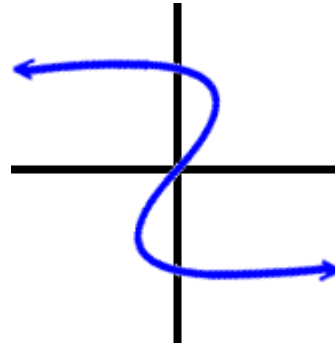
11. $x^2 + y = 2^2$

12. $s(t) = \log_6(t^2)$

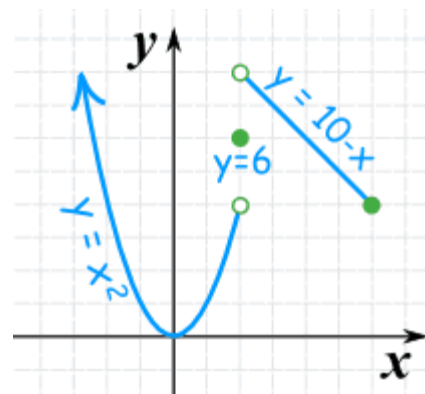
13.



14.

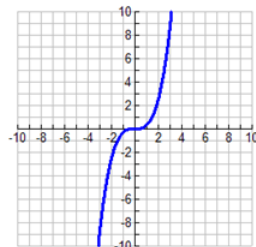


15.

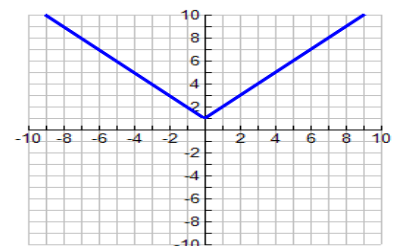


Decide whether each function is even, odd or neither. State the Domain and Range of each function.

16.



17.



18. Is the following function even, odd or neither?

$$g(x) = 7x^3 - x$$

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Section 3: Slope, Intercepts, Points

19. Identify the slope and intercepts of the line with equation $-2x = 4y = 12$. Graph the line.
20. Find the equation of the line with point $(0,1)$ with slope -3 . Write the equation in standard form. Graph the line.
21. What is the slope of the vertical line passing through $(3,2)$?
22. The line passing through the points $(1,2)$ and $(3,2)$. Without using the formula, determine the slope of this line.
23. Find the equation of the line passing through $(-3,5)$ and $(5,-2)$
24. The slope of the line is $m=2$. The line passes through the point $(1,2)$ and $(4,a)$. Find the value a .
25. Write the equation of the line $-2x = 4y = 12$ in point slope form.

Section 4: Parallel and Perpendicular Lines, Rate of change

26. Find the equation of the line perpendicular to the line with equation $-2x = 4y = 12$. Graph both lines on the same set of axes and demonstrate that they are perpendicular.
27. Find the equation of the line parallel to the line with equation $y = 5x + 9$ and passes through the point $(4,1)$. Graph both lines on the same set of axes and demonstrate that they are parallel.

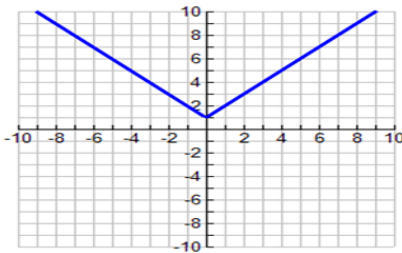
Consider $f(x) = \sqrt{x}$

28. Graph f on the interval $(-5,50)$
29. Find the average rate of change of the function f on the interval $[4, 36]$.
30. Draw the secant line passing through the line at $f(4)$ and $f(36)$.
31. What is the slope of the secant line?

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Section 5: Transformations, shifts, reflections, stretch-shrinks

Consider the graph of $f(x)$ below:



Sketch the transformations of the $f(x)$ as defined below. State the domain and range of each one.

32. $f(x + 1) - 2$

33. $-f(x - 2)$

Below, first graph the basic function f . Then, graph the transformation of that function defined by g and h . Label key points and intercepts. State the domain and range of g and h (not the basic functions)

34. basic $f(x) = x^2$ and $g(x) = -(x + 2)^2 - 1$

35. basic $f(x) = \sqrt{x}$ and $h(x) = \sqrt{2 - x}$

Section 6: Function Operations, Compositions

Given $f(x) = x^2 + 3x + 5$ and $g(x) = 2x - 7$

Find and/or evaluate:

36. Find $(f + g)(x)$

37. $(f + g)(-2)$

38. $\left(\frac{f}{g}\right)(x)$

39. $\left(\frac{f}{g}\right)(x)$

40. $(f * g)(x)$

41. $(f * g)(-1)$