

Name: _____

Solutions

MATH 1170 Quiz 2: Use the concepts from class, show your work

ID: _____

Score: _____

[2]: means question is worth 2 marks

20

1) The graph of a function f is shown. Use interval notation.a) [2] Find the domain of f .

$$(2) \quad [-5, -3) \cup (-2, -1] \cup [0, 2)$$

b) [2] Find the range of f .

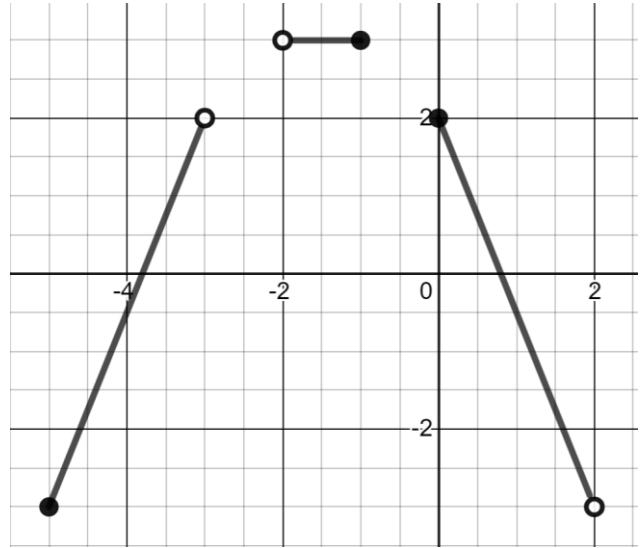
$$(2) \quad [-3, 2] \cup \{3\}$$

c) [1] On which interval(s) is f increasing?

$$(2) \quad [-5, -3)$$

d) [1] On which interval(s) is f constant?

$$(2) \quad (-2, -1]$$

2) [4] Let $f(x) = -\frac{3}{x}$. Simplify the difference quotient $\frac{f(x+h)-f(x)}{h}; h \neq 0$.

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

$$(1) = \frac{1}{h} \left[-\frac{3}{x+h} + \frac{3}{x} \right]$$

$$(2) = \frac{3}{h} \left[\frac{-x + x+h}{x(x+h)} \right]$$

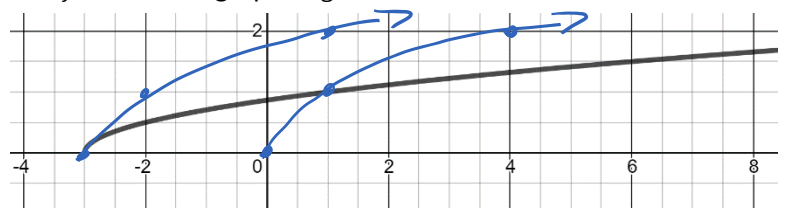
$$(1) = \frac{3}{x(x+h)}$$

3) [2] If $f(x) = \sqrt{x}$, find a formula for $g(x)$ in terms of f where the graph of g is shown.

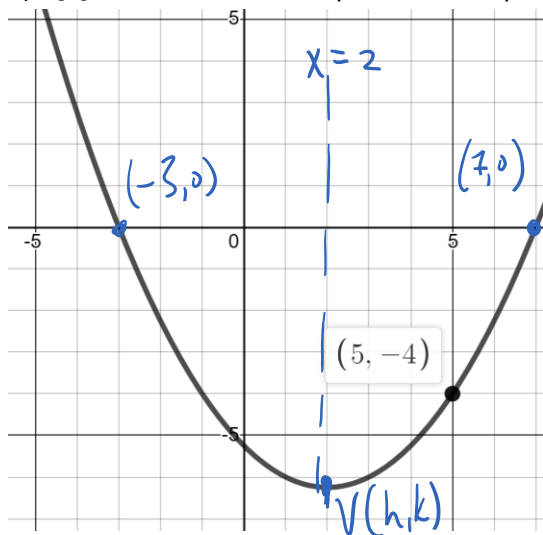
$$g(x) = \frac{1}{2} \sqrt{x+3}$$

or

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



4) [3] Find the standard equation of the parabola shown.



$$f(x) = a(x-h)^2 + k$$

$$\textcircled{1} \quad h = \frac{-3+7}{2} = 2$$

$$(-3, 0): 0 = 25a + k$$

$$(5, -4): -4 = 9a + k$$

$$4 = 16a$$

$$a = \frac{1}{4}$$

$\textcircled{1}$

$$\therefore k = -\frac{25}{4} = -6.25$$

$$\therefore f(x) = \frac{1}{4}(x-2)^2 - 6.25$$

5) Suppose $f(x) = 5x^3 - 18x^2 - 15$.

a) [3] Use synthetic division to compute $f(4)$

$$\textcircled{2} \left\{ \begin{array}{r|rrrr} 4 & 5 & -18 & 0 & -15 \\ & & 20 & 8 & 32 \\ \hline & 5 & 2 & 8 & 17 \end{array} \right.$$

$$\textcircled{1} \therefore f(4) = 17$$

b) [2] State the divisor, quotient, and remainder corresponding to this division.

$$\textcircled{0.5} \text{ Divisor} = x - 4$$

$$\textcircled{1} \text{ Quotient} = 5x^2 + 2x + 8$$

$$\textcircled{0.5} \text{ Remainder} = 17$$