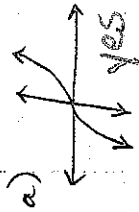


Unit 1 Test Review

1) In your own words, define discrete + continuous data. Give an example of each.

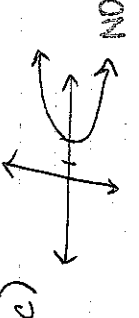
2) Are the following graphs functions? Define the domain + range.



D: $(-\infty, +\infty)$
R: $(-\infty, +\infty)$



D: $(-\infty, 0) \cup (0, +\infty)$
R: $(-\infty, 0) \cup (0, +\infty)$



D: $[-2, +\infty)$
R: $(-\infty, +\infty)$

3) Find the domains algebraically.

a) $f(x) = -4x^2 + 7x - 3$

$(-\infty, +\infty)$

b) $f(x) = \frac{1}{x^2 + 5x + 6}$

$(-\infty, -3) \cup (-3, -2) \cup (-2, +\infty)$

$[0, 1/2]$

4) Find all vertical/horizontal asymptotes, and any holes.

a) $g(x) = \frac{3}{x-2}$

$x=2$ V.A.
 $y=0$ H.A.

b) $f(x) = \frac{x}{x^2-x-2}$

$x=2, x=-1$ V.A.
 $y = \text{H.A.}$

c) $h(x) = \frac{x^2+x}{x+1}$

$x=-1$ hole
no H.A.

5) Evaluate $f(x) = -x^2 + 2x + 10$ at:

- a) $f(2) = 10$
b) $f(-5) = -25$
c) $f(x+1) = 11 - x^2$

6) Evaluate $h(x) = \begin{cases} x+1, & x \leq -5 \\ 2x^2-5, & x > -5 \end{cases}$ at:

- a) $h(1) = -3$
b) $h(-5) = -4$
c) $h(0.5) = -4.5$

6) For the following graphs determine whether the graph has symmetry.

- a) $x^2 + y^2 = 16$ x-axis, y-axis, origin
b) $y = x^3$ origin
c) $y = x^2 - \sqrt{y}$ y-axis

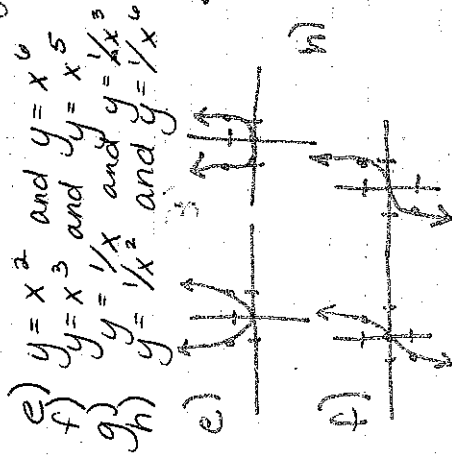
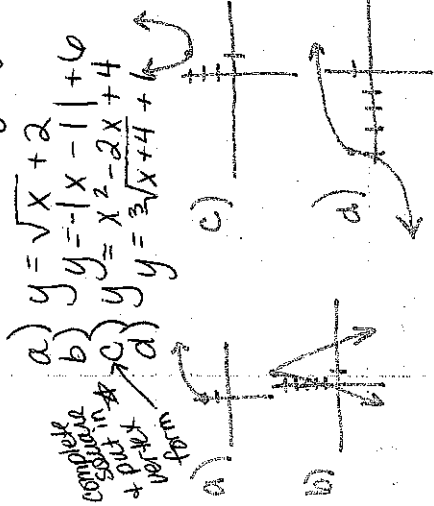
- a) $xy^2 + 10 = 0$ x-axis

7) For the following graphs, determine if the function is even, odd, or neither.

- a) $f(x) = x^5 + 4x - 7$ neither
b) $g(x) = x^4 - 20x^2$ even

- c) $h(x) = 2x\sqrt{x^2+3}$ neither

8) Sketching graphs: You should be able to know the shapes of the graphs as well as the transformations being applied. Sketch the following graphs.



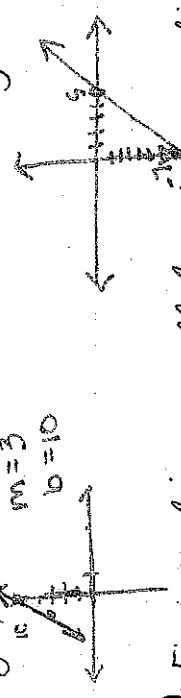
9) Given $f(x) = x^2 + 3$ and $g(x) = 2x - 1$, find:
 a) $f \circ g(x)$
 $x^2 + 2x + 2$
 b) $f - g(x)$
 $x^2 - 2x + 4$
 c) $(fg)(x)$
 $2x^3 - x^2 + 6x - 3$

d) $(f/g)(x)$ and the domain:
 $\frac{x^2+3}{2x-1}$ $(-\infty, 1/2) \cup (1/2, +\infty)$

10) Given $f(x) = \sqrt{x+4}$ and $g(x) = x^2$, find:
 a) $f \circ g$
 $\sqrt{x^2+4}$
 b) $g \circ f$
 $x+4$
 c) $f \circ f$
 $\sqrt{\sqrt{x+4}+4}$
 domains $(-\infty, +\infty)$ $[-4, +\infty)$ $[-4, 1, \infty)$

11.) Find $f \circ g \circ h$ given $f(x) = \frac{1}{1+x}$, $g(x) = \sqrt[3]{x}$, $h(x) = \frac{1}{1+1/x}$

10.) Find the slope, y-int., + sketch the line.
 a) $y = 3x + 10$
 b) $7x - 5y = 35$

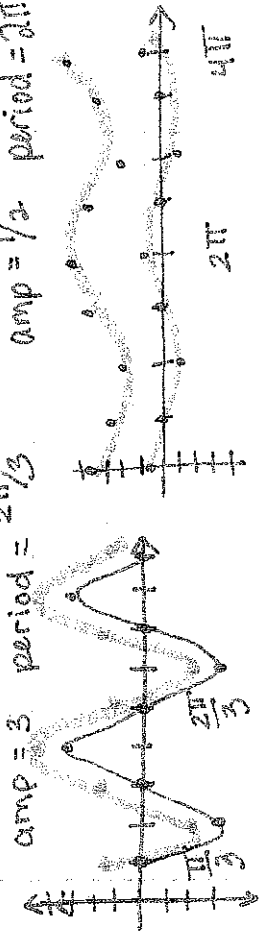


11.) Find a line parallel and perpendicular to $10x + 2y = 30$ and that goes through the point: $(-2, 5)$

$\parallel: y = -5x - 5$ $\perp: y = \frac{1}{5}x + \frac{7}{5}$

12.) Find the angle of inclination of:
 a) a line w/a slope of $m = 10$
 $\theta \approx 84.3^\circ$
 b) the line $10x + 2y = 2$
 $\theta \approx -78.7^\circ$

13.) Sketch over 2 periods; state amp. + period
 a) $y = -3\sin(3x - \pi) + 1$
 amp = 3 period = $2\pi/3$
 b) $y = \frac{1}{2}\cos(x) + 3$
 amp = $1/2$ period = 2π



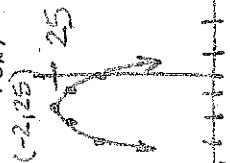
14.) Simplify the complex fractions

$$a) \frac{\frac{2x^2}{3y} - \frac{4}{xy}}{\frac{x^2}{4} + \frac{1}{3+x}} = \frac{x^2}{6y}$$

$$b) \frac{1 + \frac{2}{3+x}}{\frac{x^2}{2} + \frac{1}{3+x}} = \frac{x^2 + 5x}{3x + 6}$$

15.) Find the vertex and graph: $(-\frac{b}{2a}, f(-\frac{b}{2a}))$

$$f(x) = -x^2 - 4x + 21$$



16.) Put in vertex form + find the zeros: ✓

$$a) f(x) = x^2 - 10x + 30$$

(5, 5)

NO zeros

$$b) f(x) = 2x^2 + 8x + 7$$

(-2, -1)

$$x = -2.7, -1.3$$

17.) Solve: $-21 = 4x^2 - 4x$ 18.) Solve: $x^2 = 2x + 5$ ✓

NO_R Solution

$$x = 1 \pm \sqrt{6}$$

$$2 \text{ solutions} = \frac{4 \pm 8i\sqrt{5}}{8}$$