

Review for Math 1410 Worksheet
College Algebra

Name: _____

1. Draw a real number line and shade the following interval(s).

- (a) $[-2, \infty)$ (c) $[-\pi/2, -1)$ (e) $[0, 2\pi]$
(b) $(-4, 1/2)$ (d) $(-\infty, 732)$ (f) $(-\infty, \infty)$

2. Simplify

- (a) $\left(\frac{4a^4}{b^5}\right)^2 \frac{b^3}{a^7}$ (c) $\frac{\frac{1}{y} + \frac{y}{y-1}}{\frac{2}{y-1} - \frac{1}{y}}$
(b) $\frac{1}{t+2} + \frac{t}{t-1} - \frac{3t}{t^2+t-2}$ (d) $3(x+5)^{-\frac{1}{4}}(x-2)^2 + (x+5)^{\frac{3}{4}}(x-2)$

3. Solve the following inequalities in terms of intervals and draw the solution set on a real number line:

- (a) $1 - 7x \leq 3 + 4x$ (c) $x^3 - x^2 < 0$
(b) $|-5x + 3| \leq 4$ (d) $0 < |x - 5| < 1/2$

4. Draw a single coordinate plane and plot the following points

- (a) $(3, 4)$ (c) $(\pi, -1)$
(b) $(-\pi, 1)$ (d) $(-1/2, -1/4)$

5. State the formula for the distance between two points in the plane. Find the distance between the points $(2, 5)$ and $(4, -7)$.

6. Find the equation of the line through the following points.

- (a) $(0, 3)$ and $(2, 1)$ (b) $(-1, -1)$ and $(1/2, 3)$

7. State any definition of a function $y = f(x)$. State the definition of the domain of $f(x)$.

8. State the Vertical Line Test (VLT).

9. State the definition of what it means for a function f to be increasing on an interval I . Repeat for decreasing.

10. Sketch the following graphs (at most 2 graphs in a coordinate plane, please):

- (a) $y = x$ (d) $y = \frac{1}{x}$ (g) $y = -x/2 + 4$
(b) $f(x) = x^2$ (e) $y = |x|$ (h) $\{(x, y) \mid x^2 + y^2 \leq 3\}$
(c) $g(x) = x^3$ (f) $x^2 + y^2 = 4$ (i) $y = (x + 3)^2 - 1$

11. Let $f(x) = 3 - 4^x + x^2 - 5x + \frac{1}{3x} - \sqrt{x}$. Find the following, if possible:

- (a) $f(1)$ (c) $f(-1)$ (e) $f(a + h)$
(b) $f(0)$ (d) $f(a)$ (f) $f(x + h)$

12. Let $f(x) = \sqrt{x}$. Let $g(x) = x - 19$. Find $(f \circ g)(x)$, then state its domain.

13. Let $f(x) = 1 - x^9$, $g(x) = \frac{1}{x}$, and $h(x) = \cos x$. Find the following compositions:

- (a) $(f \circ g)(x)$ (b) $(h \circ f)(x)$ (c) $(f \circ g \circ h)(x)$