

MIDTERM 1 PRACTICE

Math 120 (Doherty)
October 19, 2007

Name _____

1. Solve each equation and state the solution set. Also state whether the equation is inconsistent, conditional, or an identity.

(a) $\{-3\}$ Conditional

(d) $\{-\frac{1}{2}\}$ Conditional

(b) $\{-2, \frac{9}{2}\}$ Conditional

(c) $\{-\frac{2}{5}\}$ Conditional

(e) $\{-1, -5\}$ Conditional

2. Write each radical in simplified form.

(a) $\frac{2x^3}{w^3} \sqrt[3]{5x}$

(b) $\frac{2x^2}{y} \sqrt[4]{3xy^2}$

3. Write the equation for each circle in standard form, and graph each one.

(a) $(x-1)^2 + (y-2)^2 = 9$ (Circle of radius 3, centered at $(1, 2)$)

(b) $(x-2)^2 + (y+1)^2 = 20$ (The radius is $2\sqrt{5}$.)

4. Find the equation of each line in slope-intercept form. State the slope, x -intercept, and y -intercept for each line.

(a) $y = -\frac{2}{3}x - \frac{5}{2}$.

(b) $y = \frac{2}{3}x + \frac{2}{9}$

5. Solve each word problem. You must set up an equation for each to receive full credit.

- (a) Tom lent his brother Dick some money at 8% simple interest, and he lent his brother Harry half as much at 10% simple interest. Both loans were for one year. If Tom made a total of \$24 in interest, how much did he lend to each one?

Dick: approximately \$184.62

Harry: approximately \$92.31

- (b) A bartender needs to make a 70% alcohol beverage. How many ounces of a 30% alcohol drink must be mixed with 20 ounces of an 80% alcohol drink to obtain a 70% alcohol mixed drink?

5 ounces.

6. (7 pts each) Solve each inequality. Graph the solution set, then write the solution set in interval notation.

(a) $[24, 36]$

(b) $(-\infty, -14] \cup [34, \infty)$

(c) $(-3, \infty)$

7. What is the domain of the function $h(x) = \frac{1}{\sqrt[4]{3-2x}}$?

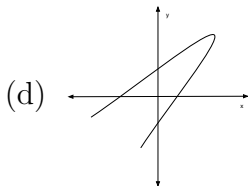
$\{x \mid x > \frac{3}{2}\}$

8. Which of the following relations are functions?

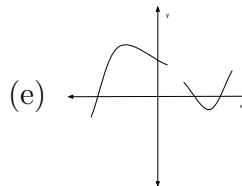
(a) $x = y^3 + 1$ Yes.

(b) $x = |y|$ No. (Find an example where 2 y -values go with the same x -value. There are lots of them.)

(c) $y = |x|$ Yes.



No. (It fails the vertical line test.)



Yes.

9. Solve each quadratic and state the solution set. Don't use the quadratic formula. Your answers should be exact and simplified (i.e., don't write radicals as decimals, no radicals in denominators and no fractions inside radicals).

(a) $\{6 + \sqrt{3}, 6 - \sqrt{3}\}$

(d) $\{\frac{1}{2}, 2\}$

(b) $\{6, -2\}$

(c) $\{\frac{1}{2}, \frac{1}{6}\}$

(e) No real solutions.

10. Let $f(x) = 2x^2 - x$ and $g(x) = \frac{3}{x}$. Find the following. For (e) and (f), simplify the difference quotients.

(a) 20

(d) $2x^2 + 7x + 8$

(f) $\frac{-3}{x(x+h)}$

(b) 1

(g) \mathbb{R}

(c) Undefined.

(e) $4x + 2h^2 - 1$

(h) $\{x \mid x \neq 0\}$