

## Week in Review # 2

MATH 150

1.6 through 1.10

Drost-Fall 2002

1. Solve:  $\frac{1}{3x+4} + \frac{8}{9x^2-16} = \frac{1}{3x-4}$

2. Solve for  $R_2$ :  $\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} - \frac{1}{R_3}$

3. Solve for  $x$ :  $y = \frac{2x+3}{5x-1}$ .

4. Solve for  $x$ :  $-1 \leq 3 - \frac{1}{2}x \leq 2$   
Write answer in interval notation.

5. If  $V = \frac{KT}{P}$ , what happens to  $P$  if  $V$  is doubled and  $T$  is cut in half?

6. A truck carries a load of 50 boxes, some 20 lb and the rest 25 lb. If the total weight is 1090 lbs., how many of each type are there?

7. How many quarts of pure antifreeze should be added to a full radiator of 10% antifreeze to bring the solution up to 20% antifreeze? When full the radiator holds 30 quarts of fluid.

8. Pipe A can fill the swimming pool in 4 days, and Pipe B can fill it in 5 days. How long will it take using both?

9. Solve:  $|3 - 5x| < 7$

10. Solve:  $|2 - \frac{1}{2}x| > 5$

11. Solve:  $|7 + 8x^2| < -2$

12. Solve:  $|10 - 2x| = |x - 2|$

13. Solve:  $|\frac{x}{5} + \frac{x}{2}| < \frac{1}{2}$

14. Solve by completing the square:

a)  $2a^2 + 8a - 3 = 0$

b)  $x^2 - \star x + \diamond = 0$

c) Factor:  $x^4 + 8x^2 + 36$

15. Solve for  $x$  by the square root method:

a)  $x^2 - 8x + 16 = S$ , where  $S = \text{something}$

b)  $x - 4 = \frac{9}{x+4}$

16. Solve for  $r$  given  $V = \frac{2}{3}\pi r^2$

17. The sum of a number and its reciprocal is 2.9. Find the numbers.

18. Solve:  $x^{\frac{1}{2}} - 4x^{\frac{1}{4}} - 5 = 0$

19. Is  $2 + \sqrt{3}$  a solution to  $x^2 - 4x + 2 = 0$ ?

20. Solve:  $6y^2 - 12 > -21y$

21. Solve:  $y^2 > 1$

22. Solve:  $\frac{3x-1}{2x+5} \leq 0$

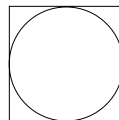
23. Solve:  $\frac{x+1}{x-2} \leq 3$

24. Solve:  $|x-2| < |3x+1|$  given that

if  $|a| < |b|$  then  $a^2 < b^2$

25. Find the area of a square if its diagonal is  $x$  ft.

26. Given a circle inscribed in a square.



If the side of the square is 8 inches, find the area of the circle.

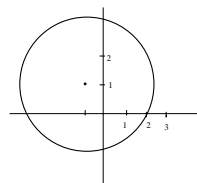
27. A farmer wants to enclose a square field with fencing material that costs \$6 per ft. If the area of the field is  $400 \text{ ft}^2$ , how much will it cost?

28. Two airplanes leave Hobby airport 30 min apart. The 1st airplane taking off flies due north at 180 mph and the second one flies due west at 240 mph. Two hours after they are both airborne, how far apart are they?

29. Find the perpendicular bisector of  $AB$ , given  $A = (4, -6)$  and  $B = (-2, 10)$ .

30. Find a point on the  $y$ -axis equidistant from  $(5, -5)$  and  $(1, 1)$ .

31. Find the equation of the circle shown below:



32. True or false:

a. All parallel lines have equal slopes.

b. Nonvertical lines are perpendicular if they have slopes which are reciprocals.

c.  $\sqrt{16x^6} = 4x^3$

d.  $\frac{x-1}{x+3} < \frac{5}{x+2}$  is equivalent to

$$(x+2)(x-1) < 5(x+3)$$

e. The domain of  $f(x) = \frac{x-5}{x^2+4}$  is all  $\mathfrak{R}$ .

22.  $\left(-\frac{5}{2}, \frac{1}{3}\right]$

23.  $x < 2$  or  $x \geq 3.5$

24.  $x < -\frac{3}{2}$  or  $x > \frac{1}{4}$

25. Area =  $\frac{x^2}{2}$

26. Area =  $16\pi$  sq in

27. \$480

28.  $\approx 658$  miles

29.  $3x - 8y + 13 = 0$

30.  $(0, -4)$

31.  $(x+1)^2 + (y-1)^2 = 10$

32. a) false, b) false, c) false, d) false, e) true

### ANSWERS:

1.  $\mathfrak{R}, x \neq \frac{4}{3}, -\frac{4}{3}$

2.  $\frac{RR_1R_3}{R_1R_3 - RR_3 + RR_1}$

3.  $x = \frac{y+3}{5y-2}$

4.  $[2, 8]$

5.  $\frac{1}{4}$  the original pressure

6. 32 twenty pound boxes, 18 twenty-five pound boxes

7.  $3\frac{1}{3}$  quarts

8.  $2\frac{2}{9}$  days

9.  $\left(-\frac{4}{5}, 2\right)$

10.  $x < -6$  or  $x > 14$

11. no solution

12.  $x = 4$  or  $8$

13.  $\left(\frac{-5}{7}, \frac{5}{7}\right)$

14. a)  $a = -2 \pm \frac{\sqrt{22}}{2}$ , b)  $x = \frac{\star}{2} \pm \frac{\sqrt{\star^2 - 4\diamond}}{2}$

14. c)  $(x^2 + 2x + 6)(x^2 - 2x + 6)$

15. a)  $x = 4 \pm \sqrt{5}$ , b)  $x = \pm 5$

16.  $r = \pm \frac{\sqrt{6\pi V}}{2\pi}$

17.  $n = \frac{5}{2}$  or  $n = \frac{2}{5}$

18.  $x = 625$

19. no

20.  $x < -4$  or  $x > \frac{1}{2}$

21.  $y < -1$  or  $y > 1$