EXAM 4 REVIEW

Math 200 – Spring 2007

The fourth exam will be on Wednesday, March 14.

The exam will cover Geometry Units 5-8 and Textbook Sections 4.1 – 4.4

All homework from Geometry Units 5-8 and Textbook Sections 4.1 – 4.4 is due at the exam (late assignments are NOT accepted).

You may use your calculator on this exam.

You may NOT use your notes, homework, book, or neighbors on this exam. You do get a $3^1/_2$ X 5 "cheat-sheet" for this exam.

Below is a review for this exam. Anything on the review could possibly be on the exam. The exam will be shorter than the review.

Review for Units 5 - 8

In exercises 1-2, use the Pythagorean Theorem and Figure 1 to find the length of the missing side.

1. $a = 28$ $b = 45$

2. $b = 77$ $c = 85$

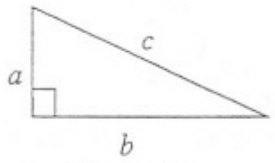
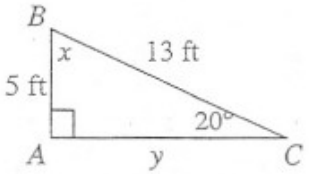


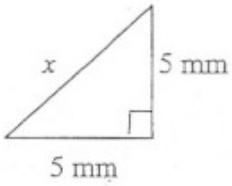
Figure 1

3. Given right triangle ABC below, find x and y.



4. A gardener is making a diagonal path across her rectangular garden. The garden measures 16 feet by 30 feet. How long is the path?

5. In the figure below, find x. Round the answer to the nearest tenth of a millimeter.



In exercises 6-7 use Figure 2 where $\Delta ABC \sim \Delta MOP$.

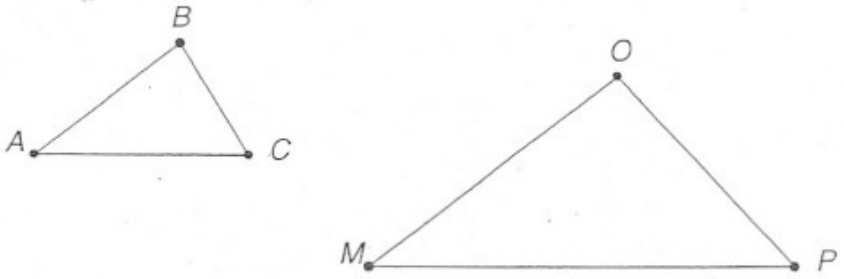
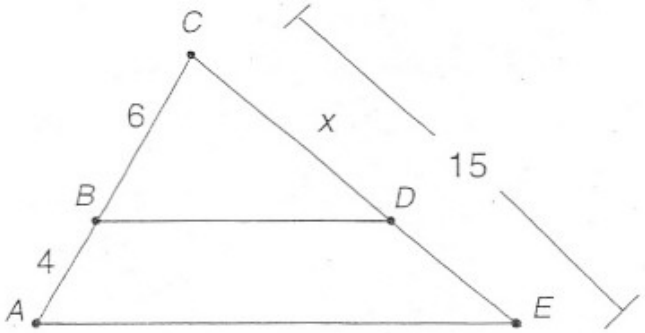


Figure 2

6. Name the congruent angles and the proportional sides.

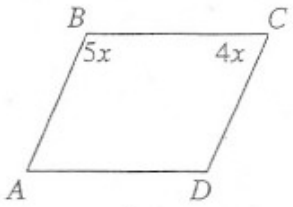
7. Find BC if $AB = 8$, $MO = 104$ *and* $OP = 78$.

8. In the figure below, $\overline{BD} \parallel \overline{AE}$ and $\Delta ACE \sim \Delta BCD$. Find CD if $AB = 4$, $BC = 6$ and $CE = 15$. There are no units of measure in this problem.



9. Draw a hexagon. How many diagonals are in a hexagon?

10. For the parallelogram below, find the measure of all four angles.



11. Figure 3 is a rectangle. Find the following:

a. AC

b. $m\angle 1$

c. $m\angle 2$

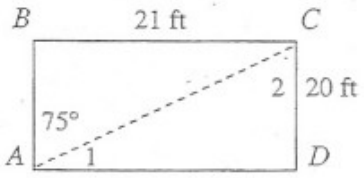


Figure 3

12. Figure 4 is a rhombus. Find the following:

a. AD

b. $m\angle 1$

c. $m\angle CAD$

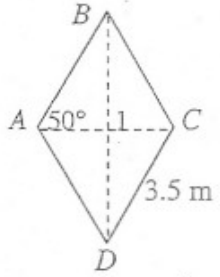
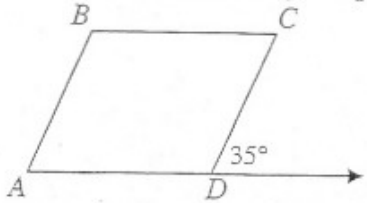


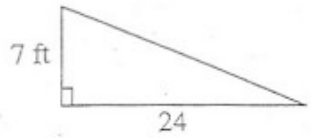
Figure 4

13. Find the measures of all the angles inside the given parallelogram.

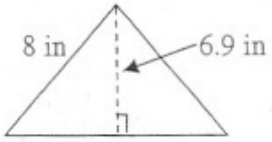


In exercises 14-17, find the area and perimeter of the given figures.

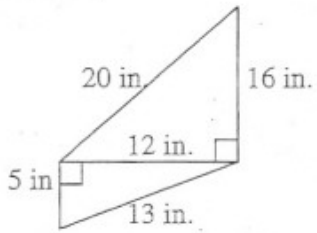
14. right triangle



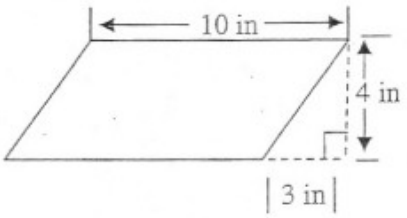
15. equilateral triangle



16. quadrilateral



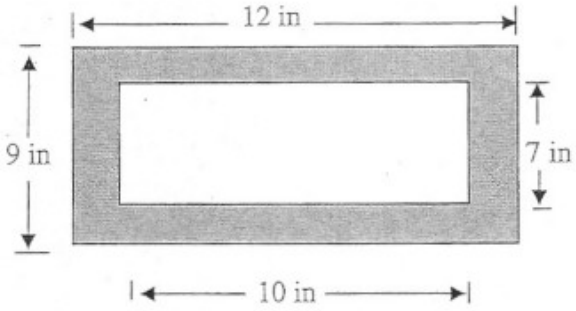
17. parallelogram



18. Find the circumference and area of a circle with a diameter of 14 centimeters. Leave the answer in terms of π.

19. Find the circumference of a circle whose area is 81π mm^2. Leave the answer in terms of π.

20. Find the area of the shaded region in the rectangular figure below.



Review for Units 5 – 8

1. $c = 53$
2. $a = 36$
3. $x = 70°;\ y = 12$ ft
4. The path is 34 feet long.
5. $x = 7.1$ mm
6. $\angle A \cong \angle M;\ \angle B \cong \angle O;\ \angle C \cong \angle P;\ \dfrac{AB}{MO} = \dfrac{BC}{OP} = \dfrac{AC}{MP}$
7. 6
8. 9
9. Draw a six-sided figure; 9 diagonals
10. $m\angle A = m\angle C = 80°;\ m\angle B = m\angle D = 100°$

11a. $AC = 29$ ft
11b. $m\angle 1 = 15°$
11c. $m\angle 2 = 75°$

12a. $AD = 3.5$ m
12b. $m\angle 1 = 90°$
12c. $m\angle CAD = 50°$

13. $m\angle A = m\angle C = 35°;\ m\angle B = m\angle CDA = 145°$
14. $A = 84$ ft^2; $P = 56$ ft
15. $A = 27.6$ in^2; $P = 24$ in
16. $A = 126$ in^2; $P = 54$ in
17. $A = 40$ in^2; $P = 30$ in
18. $C = 14\pi$ cm; $A = 49\pi$ cm^2
19. $C = 18\pi$ mm
20. 38 in^2

CHAPTER 4 REVIEW EXERCISES

In Exercises 1–2, determine whether each ordered pair is a solution of the given equation.

1. $y = 3x + 6$ $(-3, 3)$, $(0, 6)$, $(1, 9)$

2. $3x - y = 12$ $(0, 4)$, $(4, 0)$, $(-1, 15)$

In Exercises 3–4,

a. *Find five solutions of each equation. Organize your work in a table of values.*

b. *Use the five solutions in the table to graph each equation.*

3. $y = 2x - 3$

4. $y = \frac{1}{2}x + 1$

5. Graph the equation: $y = x^2 - 3$. Select integers for x, starting with -3 and ending with 3.

6. The linear equation in two variables $y = 5x - 41$ models the percentage of U.S. adults, y, with x years of education who are doing volunteer work.

a. Find four solutions of the equation. Use 10, 12, 14, and 16 for x. Organize your work in a table of values.

b. How well does the given equation model the data shown in the following table? Explain your answer.

Years of Education	10	12	14	16
Percentage Doing Volunteer Work	8.3%	18.8%	28.1%	38.4%

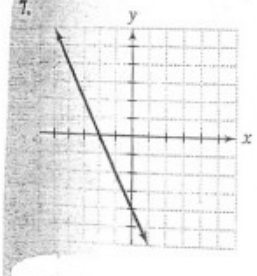
Source: U.S. Bureau of Labor

In Exercises 7–9, use the graph to identify the

a. *x-intercept, or state that there is no x-intercept.*

b. *y-intercept, or state that there is no y-intercept.*

7.



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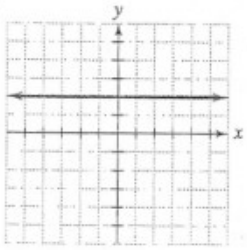

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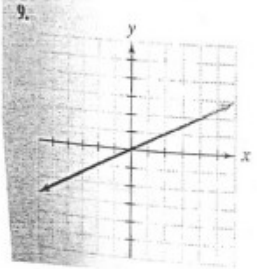


In Exercises 10–13, use intercepts to graph each equation.

10. $2x + y = 4$

11. $3x - 2y = 12$

12. $3x = 6 - 2y$

13. $3x - y = 0$

In Exercises 14–17, graph each equation.

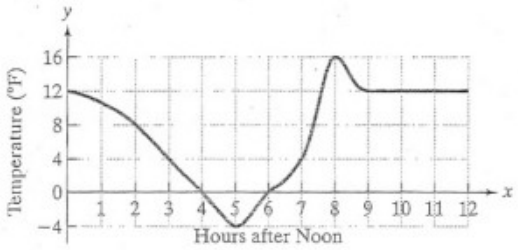
14. $x = 3$

15. $y = -5$

16. $y + 3 = 5$

17. $2x = -8$

18. The graph shows the Fahrenheit temperature, y, x hours after noon.



a. At what time did the minimum temperature occur? What is the minimum temperature?

b. At what time did the maximum temperature occur? What is the maximum temperature?

c. What are the x-intercepts? In terms of time and temperature, interpret the meaning of these intercepts.

d. What is the y-intercept? What does this mean in terms of time and temperature?

e. From 9 P.M. until midnight, the graph is shown as a horizontal line. What does this mean about the temperature over this period of time?

In Exercises 19–22, calculate the slope of the line passing through the given points. If the slope is undefined, so state. Then indicate whether the line rises, falls, is horizontal, or is vertical.

19. $(3, 2)$ and $(5, 1)$

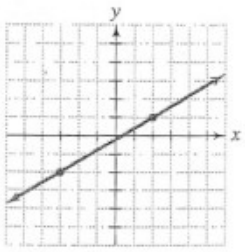
20. $(-1, 2)$ and $(-3, -4)$

21. $(-3, 4)$ and $(6, 4)$

22. $(5, 3)$ and $(5, -3)$

In Exercises 23–26, find the slope of each line, or state that the slope is undefined.

23.



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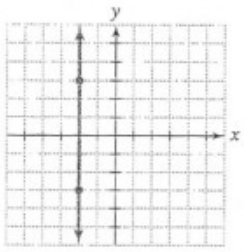

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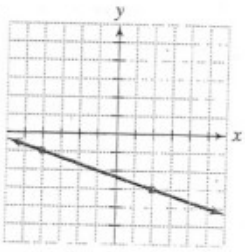
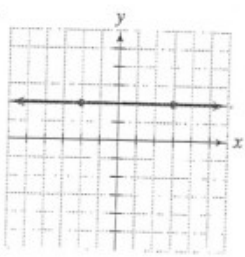


$m = -\frac{1}{3}$

26.



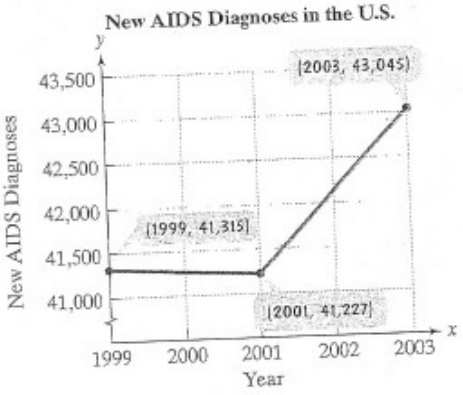
$m = 0$

In Exercises 27–28, determine whether the distinct lines through each pair of points are parallel.

27. $(-1, -3)$ and $(2, -8)$
$(8, -7)$ and $(9, 10)$

28. $(5, 4)$ and $(9, 7)$
$(-6, 0)$ and $(-2, 3)$

29. The graph shows new AIDS diagnoses among the general U.S. population, y, for year x, where $1999 \le x \le 2003$.



Source: Centers for Disease Control

a. Find the slope of the line passing through (1999, 41,315) and (2001, 41,227). Then express the slope as a rate of change with the proper units attached.

b. Find the slope of the line passing through (2001, 41,227) and (2003, 43,045). Then express the slope as a rate of change.

c. Draw a line passing through (1999, 41,315) and (2003, 43,045) and find its slope. Is the slope the average of the slopes of the lines that you found in parts (a) and (b)? Explain your answer.

In Exercises 30–33, find the slope and the y-intercept of the line with the given equation.

30. $y = 5x - 7$

31. $y = 6 - 4x$

32. $y = 3$

33. $2x + 3y = 6$

In Exercises 34–36, graph each linear equation using the slope and y-intercept.

34. $y = 2x - 4$

35. $y = \frac{1}{2}x - 1$

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

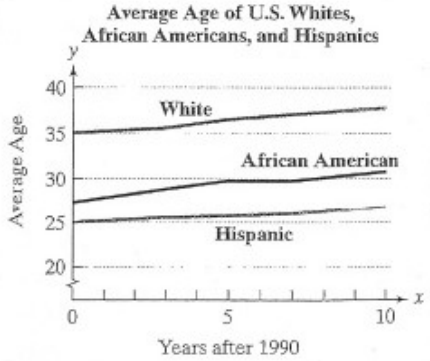
In Exercises 37–38, write each equation in slope-intercept form. Then use the slope and y-intercept to graph the equation.

37. $y - 2x = 0$ $y = 2x$

38. $\frac{1}{3}x + y = 2$ $y = -\frac{1}{3}x + 2$

39. Graph $y = -\frac{1}{2}x + 4$ and $y = -\frac{1}{2}x - 1$ in the same rectangular coordinate system. Are the lines parallel? If so, explain why.

40. The graph shows the average age of U.S. whites, African Americans, and Americans of Hispanic origin from 1990 through 2000.



Source: U.S. Census Bureau

a. What is the smallest y-intercept? Describe what this represents in this situation.

b. The average age of the group with the greatest y-intercept was approximately 38 in 2000. Use the points (0, 35) and (10, 38) to compute the slope for this group. What does this mean about their average age for the period shown?

c. Use the slope from part (b) and the y-intercept for this group shown by the graph to write an equation that models the group's average age, y, x years after 1990. Write your model in $y = mx + b$ form.

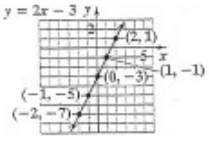
d. Use your model from part (c) to predict the average age for the group in 2010.

Review Exercises

1. $(-3, 3)$ is not a solution; $(0, 6)$ and $(1, 9)$ are solutions. 2. $(0, 4)$ and $(-1, 15)$ are not solutions; $(4, 0)$ is a solution.

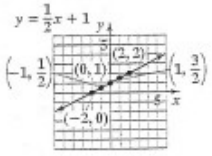
3. a.

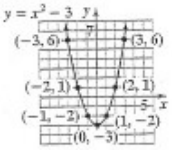
x	(x, y)
-2	$(-2, -7)$
-1	$(-1, -5)$
0	$(0, -3)$
1	$(1, -1)$
2	$(2, 1)$

b. 

4. a.

x	(x, y)
-2	$(-2, 0)$
-1	$\left(-1, \frac{1}{2}\right)$
0	$(0, 1)$
1	$\left(1, \frac{3}{2}\right)$
2	$(2, 2)$

b. 

5. 

6. a.

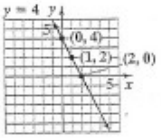
x	(x, y)
10	(10, 9)
12	(12, 19)
14	(14, 29)
16	(16, 39)

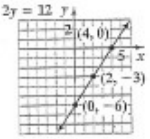
b. Answers will vary.

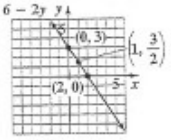
7. a. -2 b. -4

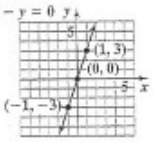
8. a. no x-intercept b. 2

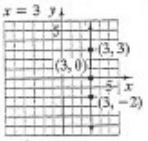
9. a. 0 b. 0

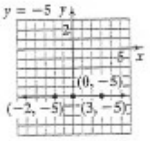
10. 

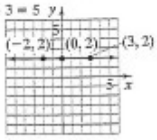
11. 

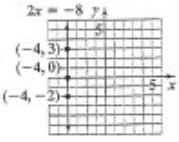
12. 

13. 

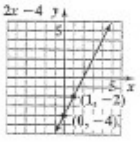
14. 

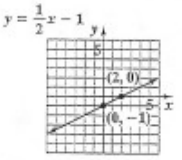
15. 

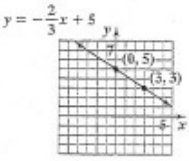
16. 

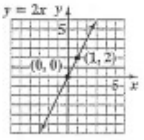
17. 

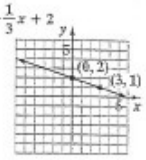
18. a. 5:00 P.M.; -4°F b. 8:00 P.M.; 16°F c. 4 and 6; At 4:00 P.M. and 6:00 P.M, the temperature was 0°F. d. 12; At noon, the temperature was 12°F. e. The temperature stayed the same, 12°F. 19. $-\frac{1}{2}$; falls 20. 3; rises 21. 0; horizontal 22. undefined; vertical 23. $\frac{3}{5}$ 24. undefined 25. $-\frac{1}{3}$ 26. 0 27. not parallel 28. parallel 29. a. $m = -44$; The number of new AIDS diagnoses decreased at a rate of 44 each year from 1999 to 2001. b. $m = 909$; The number of new AIDS diagnoses increased at a rate of 909 each year from 2001 to 2003. c. $m = 432.5$; yes; Answers will vary. 30. 5; -7 31. -4; 6 32. 0; 3 33. $-\frac{2}{3}$; 2

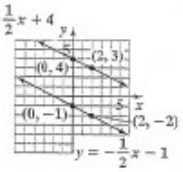
34. 

35. 

36. 

37. 

38. 

39. 

Yes, they are parallel since both have slopes of $-\frac{1}{2}$ and different y-intercepts.

40. a. 25; In 1990, the average age of U.S. Hispanics was 25.
b. 0.3; The average age for U.S. whites increased at a rate of about 0.3 each year from 1990 to 2000.
c. $y = 0.3x + 35$ d. 41 years old