MATH 7X
FINAL EXAM REVIEW

Name:_____

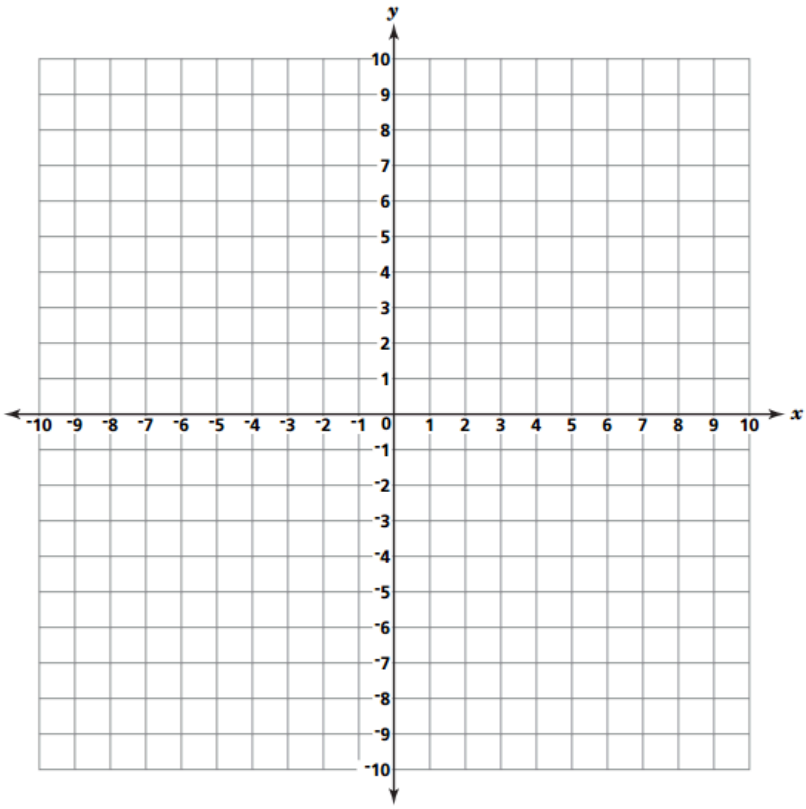
Team: _____

MATH 7x FINAL EXAM REVIEW

Student Name:_____ June 2019

TRANSFORMATIONAL GEOMETRY

1.

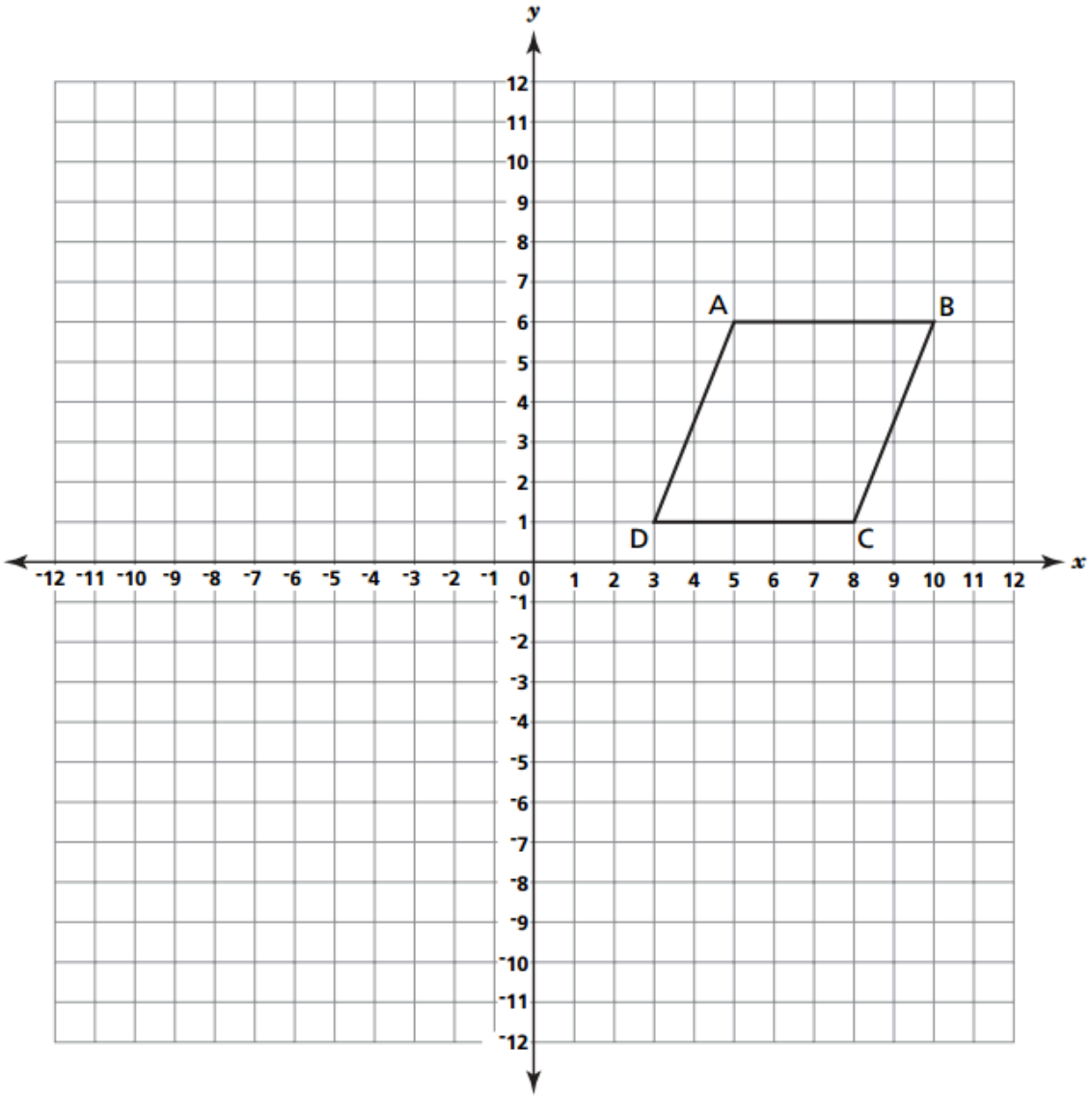


a. Plot the points A (1,1), B (4,1), C (1,-1), D(4,-1)

b. Graph the image of rectangle A'B'C'D' after a dilation of 2. Label it A'B'C'D'.

c. Graph the image of rectangle A'B'C'D' after a translation of 2 to the right and 5 down. Label it A''B''C''D''.

2.



a. Reflect quadrilateral ABCD over the x-axis. Label the image A'B'C'D'.

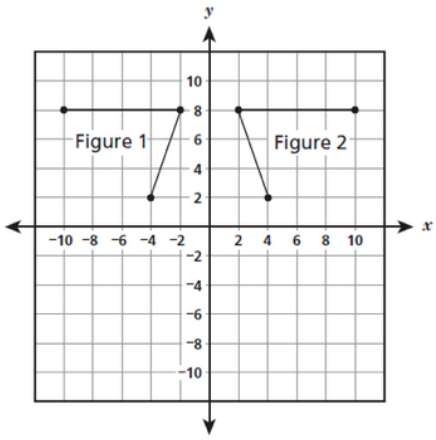
b. Translate quadrilateral A'B'C'D' 2 units left and 3 units up. Label the image A"B"C"D".

SEQUENCE OF TRANSFORMATIONS

3. Rectangle R undergoes a dilation with scale factor 0.5 and then a reflection over the y-axis. The resulting image is Rectangle S. Which statement about Rectangles R and S is true?

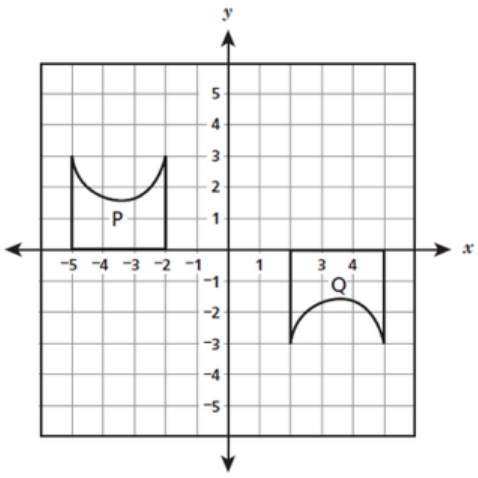
a. They are congruent and similar.
b. They are similar but not congruent.
c. They are congruent but not similar.
d. They are neither congruent nor similar.

4. Figure 1 can be transformed to create Figure 2 using a single transformation.



a. dilation
b. rotation
c. translation
d. reflection

5. Figure Q was the result of a sequence of transformations on figure P, both shown below. Which sequence of transformations could take figure P to figure Q?



e. reflection over the x-axis and a translation of 7 units right
f. reflection over the y-axis and a translation of 3 units down
g. translation 1 unit right and 180° rotation about the origin
h. translation 4 units right and 180° rotation about the origin

PARTS OF AN EQUATION AND THEIR MEANING IN CONTEXT

6. Annette plans to visit an amusement park where she must pay for admission and purchase tickets to go on rides. Annette wants to find the total cost for a day at the amusement park. She wrote the equation $c = 1.50x + 12$ to predict c, the total cost for a day at the amusement park. What could the number 12 represent in Annette's equation?

a. the number of rides
b. the cost of admission
c. the cost of each ticket
d. the number of tickets

7. The owner of a small computer repair business has one employee, who is paid an hourly rate of $22. The owner estimates his weekly profit using the equation y = 8600 - 22x. In this equation, x represents the number of

a. computers repaired per week
b. hours worked per week
c. customers served per week
d. days worked per week

8. A company that manufactures radios first pays a start-up cost, and then spends a certain amount of money to manufacture each radio. If the cost of manufacturing r radios is given by the equation c = 5.25r + 125, then the value 5.25 best represents

a. the start-up cost
b. the profit earned from the sale of one radio
c. the amount spent to manufacture each radio
d. the average number of radios manufactured

9. A cell phone company charges $60.00 a month for up to 1 gigabyte of data. The cost of additional data is $0.05 per megabyte. If d represents the number of additional megabytes used and c represents the total charges at the end of the month, which linear equation can be used to determine a user's monthly bill?

a. c = 60 - 0.05d
b. c = 60.05d
c. c = 60 + 0.05d
d. c= 60d - 0.05

SOLVING MULTI-STEP EQUATIONS

10. Solve and check

a. $12x - 15 = 5(x + 4)$

SOLVE	CHECK

b. $11 - 3x - 4 = 10(2x + 3)$

SOLVE	CHECK

11. Solve the following equations:

a. $3(x + 4) – 10 = 3x – 2(2x – 9)$

SOLVE

b. $2.7x - 19 + 6.4 - 1.4x = 0.6(x – 7)$

SOLVE

c.

$$0.4\left(2x + \frac{1}{2}\right) = 3[0.2x + (-2)] - 4$$

SOLVE

d. -5(1 – 5x) + 5(-8x – 2) = -4x – 8x

SOLVE

e. $-6.37 + 0.3(2x + 0.5) = 0.7(x + 0.4) + 1.2x$

SOLVE

IDENTIFYING THE NUMBER OF SOLUTIONS AN EQUATION HAS:

12. For each equation, place a check mark in one column.

EQUATION	NO SOLUTION	ONE SOLUTION	INFINITELY MANY SOLUTIONS
$36x + 24 = 12(x + 2 + 2x)$			
$x = x + 1$			
$-12(x + 2) = -14x + 2$			
$2(3x + 6) = 6x + 12$			
$10x + 20 = 2(5x + 3)$			
$18x + 20 = 16x - 14$			

SIMPLIFYING ALGEBRAIC EXPRESSIONS

13. Simplify each expression below:

$14a - 5b + 5c - 6a - 12b - 14c$	$2(x + 4) - 3(x - 2) + 5x - 25$
$5x(xy + 2xy^2)$	$2(3x + 4y) - (5x - 3y)$

FACTORING LINEAR EXPRESSIONS

14. Factor.

$25x + 30$	$24x + 32$
$40x - 50$	$42xy - 49y$
$6x + 9$	$10x - 15xy$

WRITING EQUATIONS FROM A PROBLEM IN CONTEXT

15. A gym offers two packages for yearly membership. The first plan costs $50 to be a member. Then each visit to the gym is $5. The second plan costs $200 for a membership fee plus $2 per visit. Write and solve an equation that can be used to determine how many times you have to visit the gym for the cost to be the same.

16. UPS charges $7 for the first pound, and $0.20 for each additional pound. FedEx charges $5 for the first pound and $0.30 for each additional pound. Write and solve an equation that can be used to determine how many pounds, p, will it take for UPS and FedEx to cost the same?

TWO STEP INEQUALITIES

17. Ben went to the arcade with $30 to spend. He spent $5.50 food at lunch. He also paid $3.00 per game.

Part A: Write and solve an inequality that can be used to determine the greatest number of games that Ben can play.

Part B: What is the greatest number of games that Ben can play?

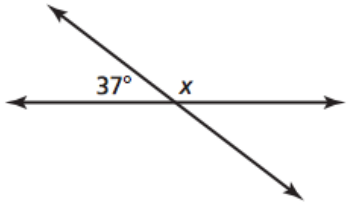
18. When Michelle bought her new car, she purchased an extended warranty. The warranty has a $500 yearly fee, and a $10 fee for each oil change. Michelle can only spend $575 on her car this year.

Part A: Write and solve an inequality that can be used to show the number of oil changes she can get this year.

Part B: What is the maximum number of oil changes that Michelle can get this year?

EUCLIDEAN GEOMETRY

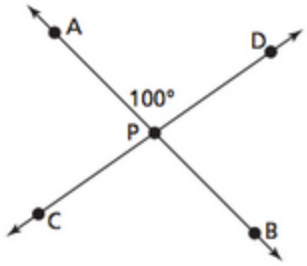
19. In the diagram below, what is the measure of angle x?



[not drawn to scale]

a. 37
b. 53
c. 127
d. 143

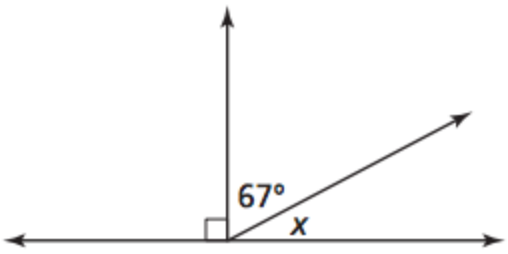
20. In the diagram below, $\overleftrightarrow{AB}$ intersects $\overleftrightarrow{DC}$ at point P.



What is the measure of <CPB in the figure?

a. 80
b. 90
c. 100
d. 105

21. What is the measure of <x in the diagram shown below?



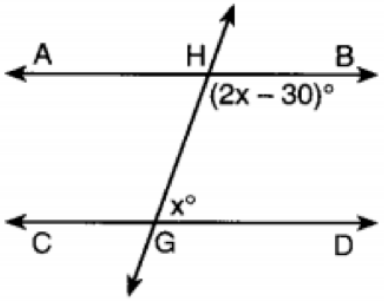
[not drawn to scale]

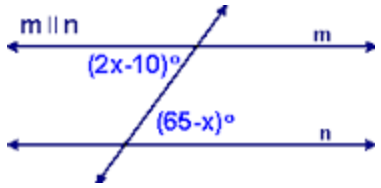
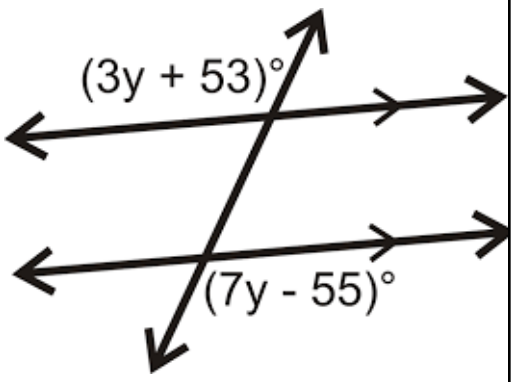
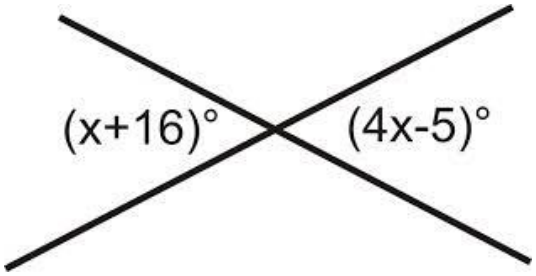
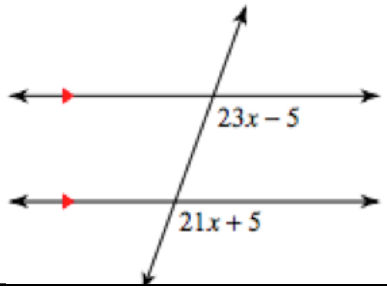
a. 23
b. 33
c. 113
d. 157

EUCLIDEAN GEOMETRY

22. Solve for the missing variable.

a.



b. 	
c. 	
d. 	
e. 	

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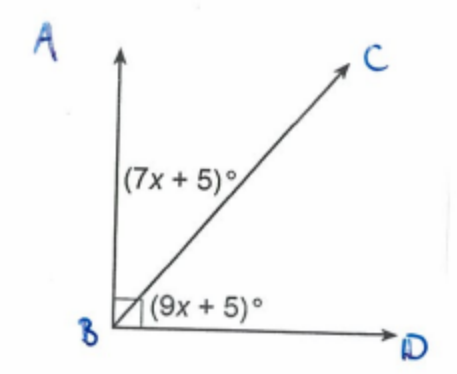
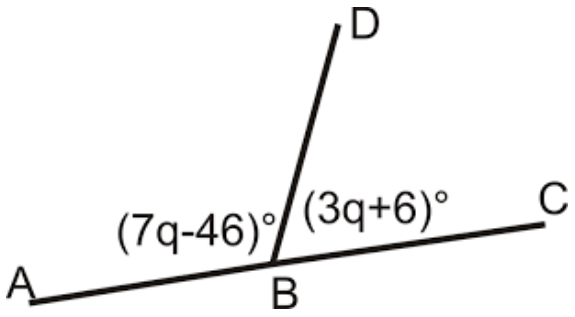


g.



What is the value of q? _____

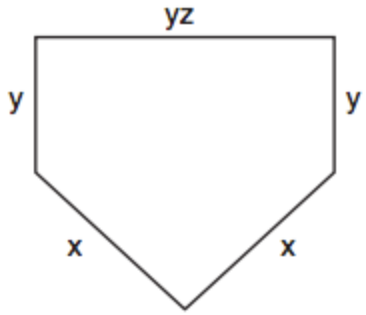
What is m < ABD? _____

What is m < DBC? _____

PERIMETER

23. The length of a side of a square window in Jessica's bedroom is represented by 2x - 1. Write an expression that represents the perimeter of the window.

24. The lengths of the sides of home plate in a baseball field are represented by the expressions in the accompanying figure.

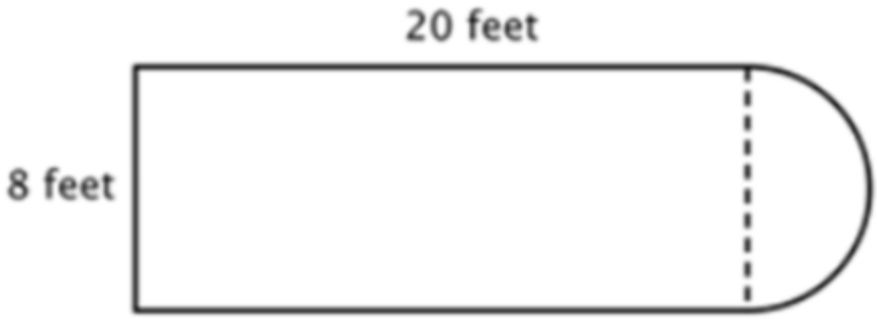


Which expression represents the perimeter of the figure?

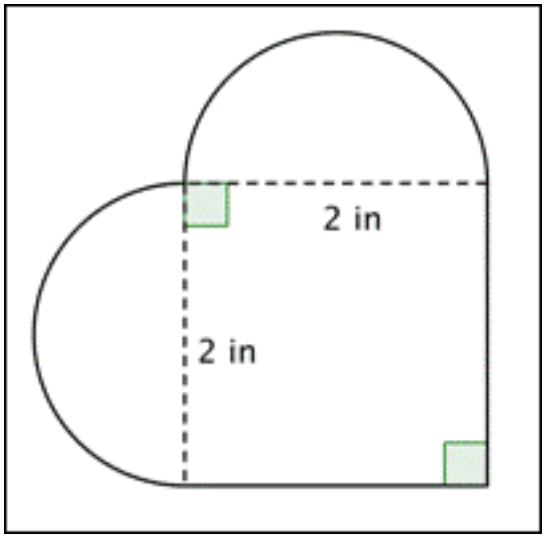
a. 5xyz
b. $x^2 + y^3z$
c. 2x + 3yz
d. 2x + 2y + yz

AREA OF COMPOSITE FIGURES

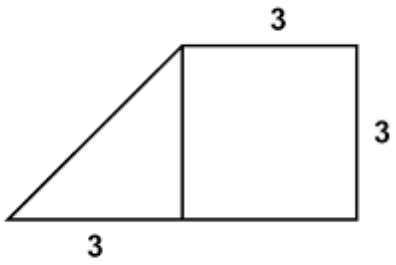
25. Find the area. Round your answer to the nearest whole number.



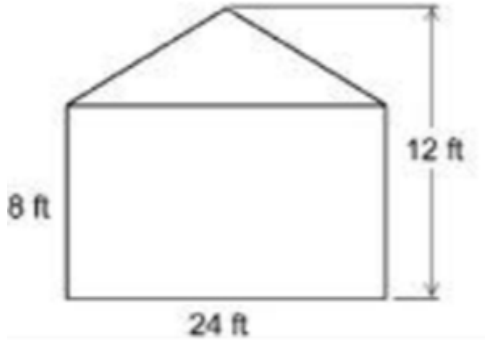
26. Find the area. Round your answer to the nearest tenth.



27. Find the area.



28. Find the area.



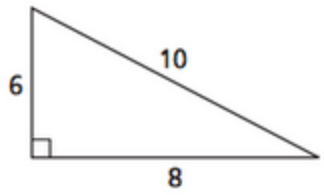
THREE DIMENSIONAL GEOMETRY

29. A rectangular prism has a length of 4.5 in. and a width of 3.2 in. What is the height of the prism if the volume is 96.48in^3?

PROVING A TRIANGLE IS RIGHT

30. Based on the Pythagorean theorem, which relationship is true for the sides of the triangle shown below?

a. $8^2 + 10^2 = 6^2$
b. $6^2 + 8^2 = 10^2$
c. $6^2 + 8^2 = 10$
d. $6^2 + 10^2 = 8^2$



Pythagorean theorem:
$c^2 = a^2 + b^2$

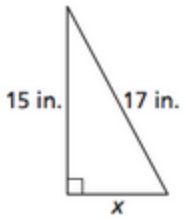
31. Which set of numbers represents the lengths of the sides of a right triangle?

a. 7, 24, 25
b. 9, 16, 23
c. 10, 12, 14
d. 14, 16, 18

PYTHAGOREAN THEOREM

32. What is the length of side x in the triangle below?

a. 2 inches
b. 8 inches
c. 23 inches
d. 32 inches



[not drawn to scale]

33. In triangle ABC below, < ACB is a right angle. If the length of $\overline{AC}$ is 8 centimeters and the length of $\overline{AB}$ is 10 centimeters, what is the length, in centimeters, of $\overline{BC}$?

[not drawn to scale]

$c^2 = a^2 + b^2$

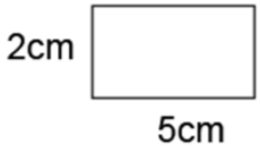
a. 2
b. 4
c. 5
d. 6

34. Your family wants to purchase a new television with a 50” widescreen. Since the 50 inches represents the diagonal measurement of the screen (upper corner to lower corner), you want to find out the actual dimensions of the television. When you measured the television at the store, the height was 30 inches, but you don’t remember the width. What is the width of the television? Draw a diagram to represent this situation.

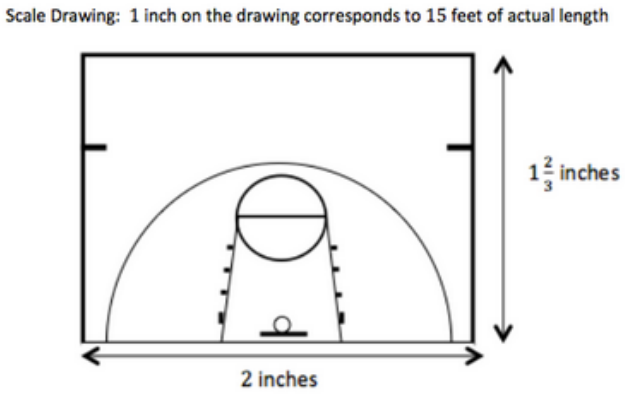
35. The bottom of a 13-foot straight ladder is set into the ground 5 feet away from a wall. When the top of the ladder is leaned against the wall, what is the distance above the ground it will reach?

SCALE DRAWINGS

36. Find the dimensions of the actual room if the scale is 1 cm = 10 feet.



37. The diagram is a scale drawing of half-court of a basketball court.



a. Using the scale 1 inch = 15 feet, calculate the actual length and width of half court.

b. What is the actual area of half court?

PERCENT APPLICATIONS: TAX, TIP, SALE PRICE, SIMPLE INTEREST

38. Sally opened a retirement account with $36,500. She earned 7% simple interest. She made no deposits or withdrawals on the account. At the end of 20 years, how much money did she have in the account?

39. David bought a computer that was 20% off the regular price of $1,080. If an 8% sales tax was added to the cost of the computer, what was the total price David paid for it?

a. $302.40
b. $864.00
c. $933.12
d. $1,382.40

40. Angelina bought a plasma television that was on sale for 10% off the original price. She also used a coupon that gave her an additional 20% off the sale price of the television set. The original price of the television set was $600. What is the new price of the television before tax?

41. Ramona is a travel agent. She receives a 6% commission on vacation package sales.

Part A: How much commission will Ramona make if she sells $4,600 in vacation packages?

Part B: Ramona earns an additional 2% bonus on the sale of vacation packages during February. What would be her combined commission and bonus if she sells $4,600 in vacation packages during February?

42. Ava wants to buy a new television for her living room.

Amazon is selling a $1200 television with a 20% discount. A 7.5% sales tax will be applied to the discounted price.

The same television is also available at Best Buy for $1100 with a 10% discount. A 8% sales tax will be applied to the discounted price of the television along with a delivery fee of $50.

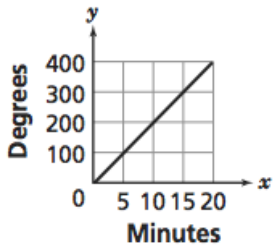
What is the difference in the total costs of the televisions between the two stores?

UNIT RATES REPRESENTED IN TABLES, GRAPHS, AND EQUATIONS

43. Last week Len spent $18 to bowl 4 games. This week he spent $27 to bowl 6 games. Len owns his bowling ball and shoes, so he only has to pay for each game that he bowls. If each of these bowling games costs the same amount of money, what is the constant of proportionality between the money spent and the number of games played?

a. 1.5
b. 2.0
c. 4.5
d. 9.0

44. John drew the graph below to represent a situation.



Which statement could describe the situation John graphed?

a. The temperature of a frozen pizza cooking in an oven increases 5 degrees every minute.
b. The temperature of a frozen pizza cooking in an oven increases 10 degrees every minute.
c. The temperature of a frozen pizza cooking in an oven increases 15 degrees every minute.
d. The temperature of a frozen pizza cooking in an oven increases 20 degrees every minute.

45. Every spring, the Devins family rents a powerful vacuum cleaner to clean all the carpets and rugs in their apartment. The cost is $42.99 for a three day rental. Which equation below shows the cost of the rental, r, for any number of days, d?

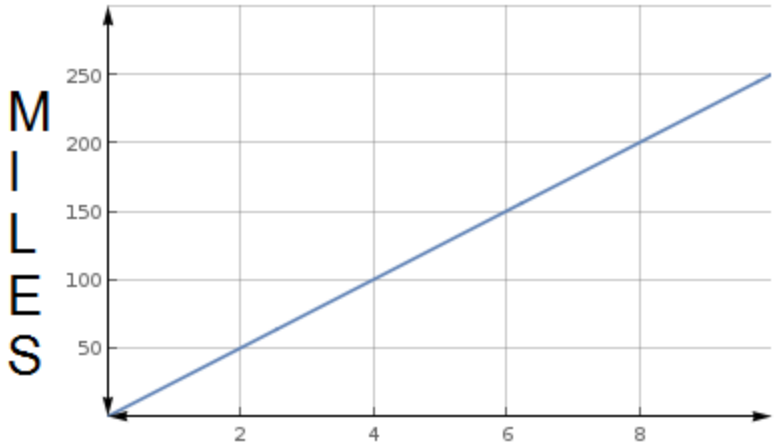
a. $r = 42.99d$
b. $r = d + 42.99$
c. $r = 14.33d$
d. $r = 14.33d + 42.99$

46. The gasoline mileage for two cars can be compared by finding the distance each car traveled and the amount of gasoline used. The table shows the distance that that car M traveled using x gallons of gasoline. The graphs shows the distance, y, that car P traveled using x gallons of gasoline.

CAR M

Gallons	Miles
3.5	105
5.5	165
7.5	225
9.5	285

CAR P



Based on the information in the table and the graph, compare the approximate miles per gallon of car M to car P. Show your work or explain your answers.

- How many miles per gallon does Car M get? _____

- How many miles per gallon does Car P get? _____

47. The table shown below was posted on the wall at Andy's Hardware to show the price of varying lengths of chain-link fencing.

PRICE OF FENCING

Length (feet)	Price
75	$168.75
125	$281.25
175	$393.75
225	$506.25

The price of the same fencing at Bargain Hardware can be determined by the equation $y = 2.50x$, where y is the price in dollars, for x feet of fencing.

Determine the unit price for fencing, in dollars per foot, for each store.

Show your work.

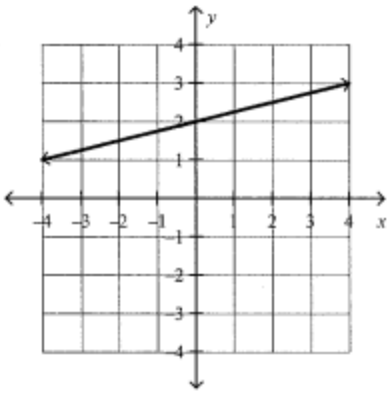
Answers:

Andy's Hardware $_____ per foot

Bargain Hardware $_____ per foot

WRITING AN EQUATION FROM A GRAPH

48. Which linear equation represents the graph?



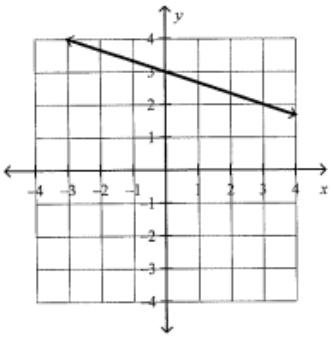
a. $y = 4x + 2$

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

c. $y = 4x - 2$

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

49. Which linear equation represents the graph?



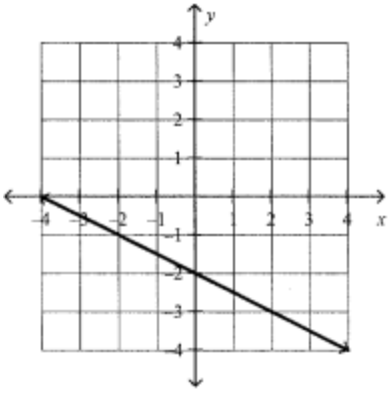
a. $y = \frac{1}{3}x + 3$

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

c. $y = 3x - 2$

d. $y = -3x - 2$

50. Which linear equation represents the graph?



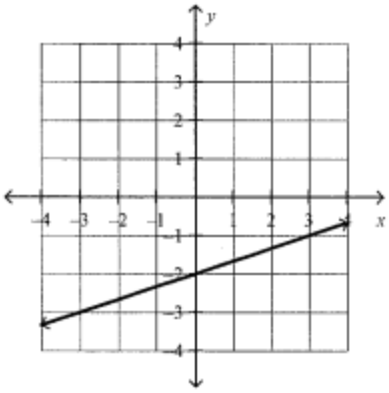
a. $y=\frac{1}{2}x-2$

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

c. $y=2x+2$

d. $y=-2x+2$

51. Which linear equation represents the graph?



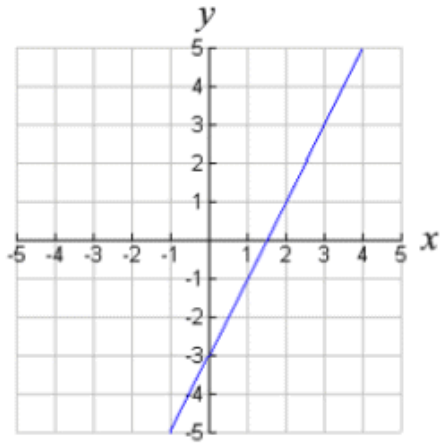
a. $y=3x+2$

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

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

d. $y=-3x+2$

52. Which linear equation represents the graph?



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

b. $y=2x-3$

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

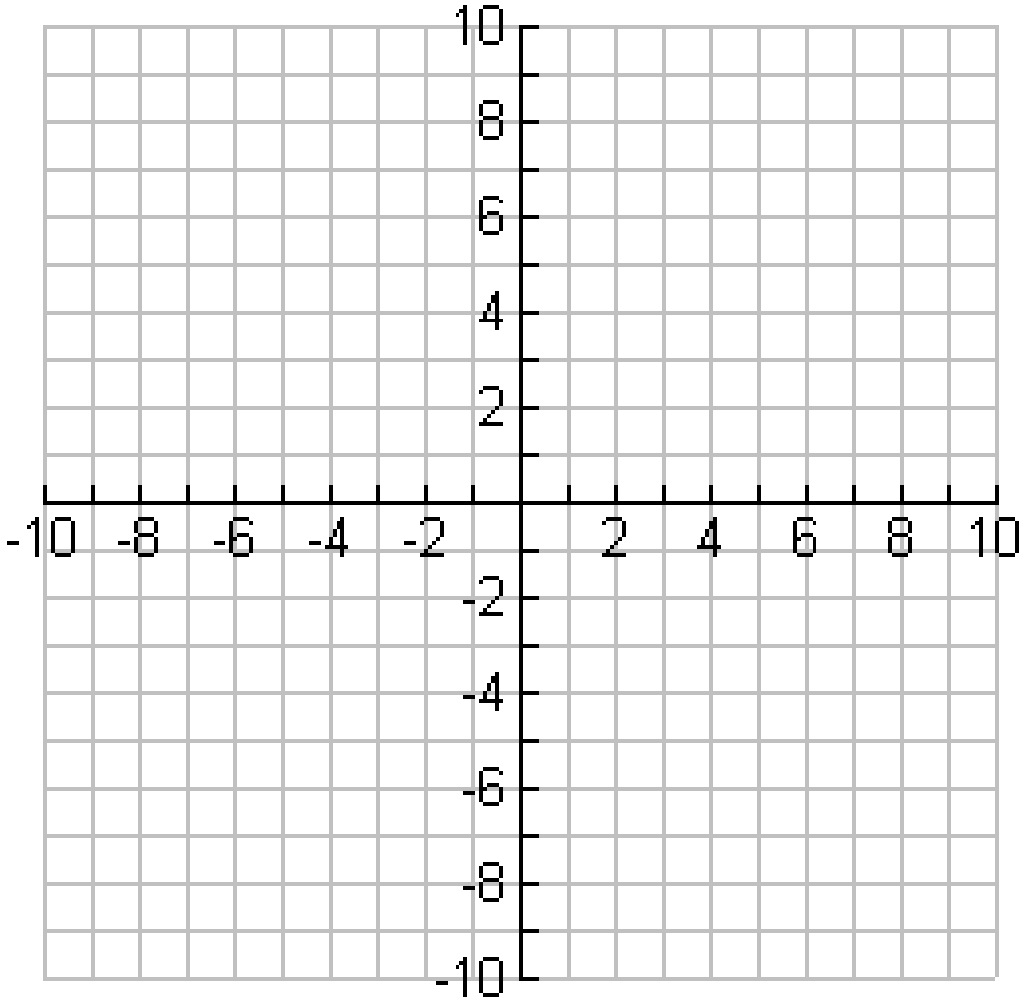
d. $y=-2x-3$

GRAPHING LINEAR EQUATIONS (y=mx+b)

53. Graph and label the given equations on the coordinate grid below.

$$y = \frac{2}{3}x + 2$$

$$y = -x + 7$$

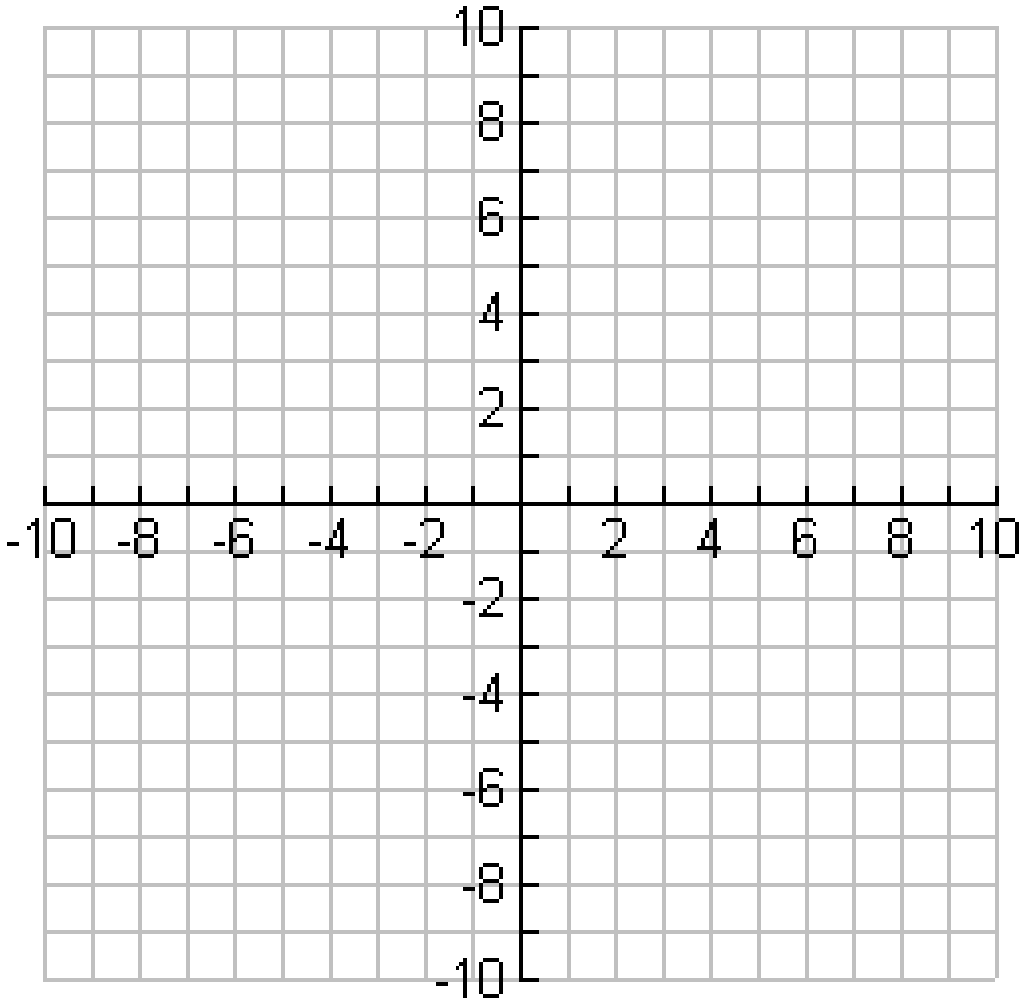


What is the solution to the system of equations?

54. Graph and label the given equations on the coordinate grid below.

$y = 2x + 1$

$y = -3x + 6$



What is the solution to the system of equations?

LAW OF EXPONENTS & NEGATIVE EXPONENTS

55. What is the product of $3a^2b$ and $-2ab^3$?

(1) a^2b^3
(2) a^3b^4
(3) $-6a^2b^3$
(4) $-6a^3b^4$

56. The expression $\frac{24x^6y^3}{-6x^3y}$ is equivalent to

(1) $-4x^2y^3$
(2) $-4x^3y^3$
(3) $-4x^9y^4$
(4) $-4x^3y^2$

57. Which expressions are equivalent to $\frac{1}{2^6}$? Select all that apply.

Ⓐ $2^{-5} \cdot 2^{-1}$

Ⓑ $2^{-3} \cdot 2^{2}$

Ⓒ $2^{-2} \cdot 2^{-4}$

Ⓓ $2^{1} \cdot 2^{5}$

Ⓔ $2^{1} \cdot 2^{6}$

Ⓕ $2^{2} \cdot 2^{-8}$

Ⓖ $2^{3} \cdot 2^{3}$

58. Which expression is equivalent to $4^7 \times 4^{-5}$?

a. 4^{12}
b. 4^2
c. 4^{-2}
d. 4^{-35}

59. Which number is equivalent to $\frac{3^4}{3^2}$?

a. 2
b. 9
c. 81
d. 729

60. Simplify: $\frac{4^8}{4^{-4}}$

a. 4^{-32}
b. 4^{-2}
c. 4^4
d. 4^{12}

61. Rewrite each expression with positive exponents.

a. $\frac{a}{b^{-5}}$	b. $\frac{3}{2^{-3}}$	c. $10x^3y^{-5}z^{-6}$
d. $\frac{jk}{t^{-7}}$	e. $9a^4b^{-5}c^{-6}$	f. $\frac{7x}{y^{-5}z^{-3}}$

SQUARE ROOTS & CUBE ROOTS

62. What is the volume of a cube whose side measures 3 cm?

63. Write and solve an equation that can be used to calculate the side length of a cube whole volume measures 729 in^3?

64. Write and solve an equation that can be used to find the side length of the square with an area of 110.25 square inches. Express your answer to the nearest tenth.

65. Simplify the following radicals:

a. $\sqrt{75}$	B. $\sqrt{72}$	C. $\sqrt{300}$	D. $\sqrt{90}$	E. $\sqrt{80}$

PROBABILITY & STATISTICS

66. Cassie rolls a fair number cube with 6 faces labeled 1 through 6. She rolls the number cube 300 times. Which result is most likely?

a. Cassie will roll a 1 or 2 about 50 times.
b. Cassie will roll a 1 or a 2 exactly 50 times.
c. Cassie will roll an even number about 150 times.
d. Cassie will roll an even number exactly 150 times.

67. A store owner made a list of the number of greeting cards sold last month. The store sold 150 thank you cards, 292 birthday cards and 58 blank cards. Find the probability of the following events. Be sure your answer is in simplest form.

P (thank you card)	P (birthday card)	P (blank card)

TRIANGLE INEQUALITY THEOREM

68. Determine whether each set of three numbers can be the lengths of the sides of a triangle.

a. 2, 6, 7	d. 5, 7, 15
b. 3, 9, 11	e. 8, 10, 12
c. 5, 9, 18	f. 7, 13, 21