Name _____ Block 1

W-UPS

Algebra 2A

PRACTICE FINAL EXAM

Multiple Choice

Identify the choice that best completes the statement or answers the question.

To which sets of numbers does the number belong?

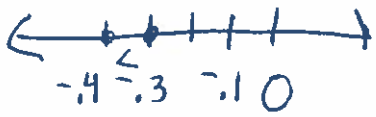
1. $\sqrt{27}$
   a. rational numbers, irrational numbers
   b. integers, rational numbers, real numbers
   c. whole numbers, integers, rational numbers, real numbers
   d. irrational numbers, real numbers

2. -9
   a. whole numbers, integers, rational numbers, real numbers
   b. whole numbers, integers, real numbers
   c. integers, rational numbers, real numbers
   d. rational numbers, real numbers

Insert <, >, or = to make the sentence true.

3. $20.64 \square \sqrt{100}$
   a. > 20.64 > 10
   b. <
   c. =

4. $-\frac{1}{3} \square -\frac{2}{5}$ $-.\overline{3} > -.4$
   a. =
   b. >
   c. <



5. $-|-16| \square |5|$
   a. > $-16 < 5$
   b. =
   c. <

6. $|18 + 20| \square |-5 - 2|$
   a. <
   b. > $|38| \quad |-7|$
   c. = $38 > 7$

Name the property of real numbers illustrated by the equation.

7. $6 \cdot (\sqrt{9} \cdot 11) = (6 \cdot \sqrt{9}) \cdot 11$ Parentheses move
   a. Commutative Property of Multiplication
   b. Distributive Property
   c. Associative Property of Addition
   d. Associative Property of Multiplication

8. $\pi \cdot 6 = 6 \cdot \pi$
   a. Associative Property of Multiplication
   b. Commutative Property of Addition
   c. Commutative Property of Multiplication
   d. Closure Property

3.5) Factor $3x^2 - 48 = 3(x^2 - 16)$

$3(x-4)(x+4)$

Evaluate the expression for the given value of the variable(s).

9. The expression $-16t^2 + 1100$ models the height of an object t seconds after it has been dropped from a height of 1100 feet. Find the height of an object after falling for 4.4 seconds.

a. 1029.6 ft
b. 790.24 ft
c. 6056.16 ft
d. 1409.76 ft

$-16(4.4)^2+1100$

10. $5a + 5b$; $a = -6$, $b = -5$

a. -55
b. 55
c. 5
d. -5

Simplify by combining like terms.

11. $5c - d - 6c - 8d$

a. $c - 9d$ b. $-c - 9d$ c. $-9c - d$ d. $-c + 9d$

Solve the equation.

12. $-2y + 2 = -9 - 3y$

a. -11
b. $-\frac{1}{11}$
c. $3\frac{1}{2}$
d. -7

$-2y+2=-9-3y$
$+3y \quad +3y$
$y+2=-9$
$-2 \quad -2$
$y=-11$

13. $x^2 + 8x + 16 = 36$

a. $10, -10$
b. $2, -2$
c. $2, -10$
d. $10, -2$

$-36 \quad -36$
$x^2+8x-20=0$
$(x+10)(x-2)$
$x=-10 \quad x=2$

14. $(x + 5)^{\frac{2}{5}} = 4$

a. -1
b. $27; -37$
c. 9
d. $37; -37$

$(27+5)^{(2/5)}$

15. $|3x + 5| = 1$

a. $x = 2$ or $x = -1\frac{1}{3}$
b. $x = 2$ or $x = -4$
c. $x = 2$ or $x = -2$
d. $x = -1\frac{1}{3}$ or $x = -2$

$3x+5=1$
$-5 \quad -5$
$\frac{3x}{3}=\frac{-4}{3}$

$3x+5=-1$
$-5 \quad -5$
$\frac{3x}{3}=\frac{-6}{3}$
$x=-2$

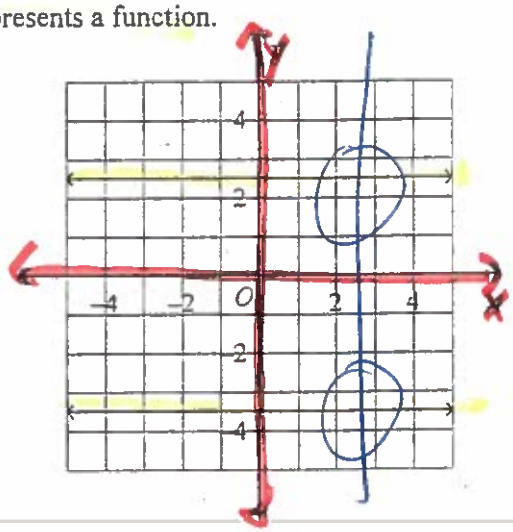
16. $\sqrt{x + 10} - 7 = -5$

a. 14
b. -8
c. 4
d. -6

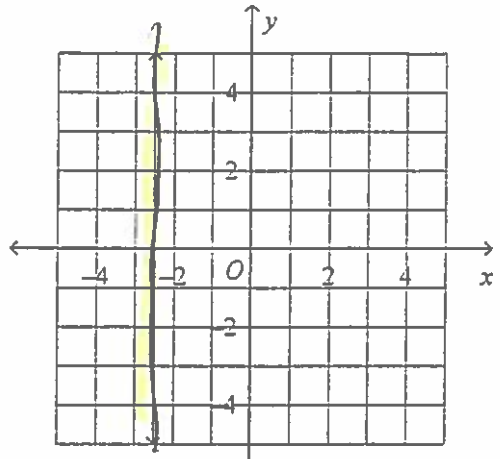
$\sqrt{(-6+10)}$
$\sqrt{4}$
$2-7=-5$

17. Use the vertical-line test to determine which graph represents a function.

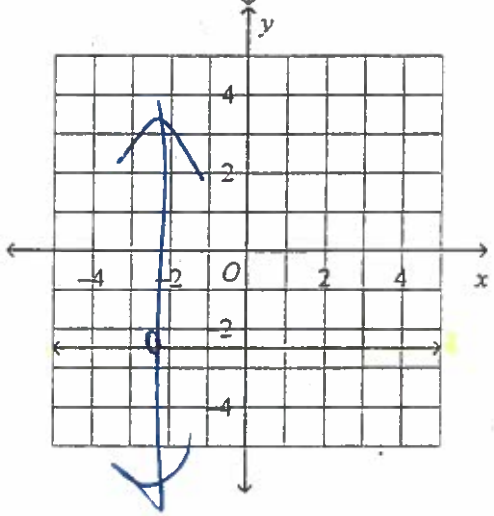
a.



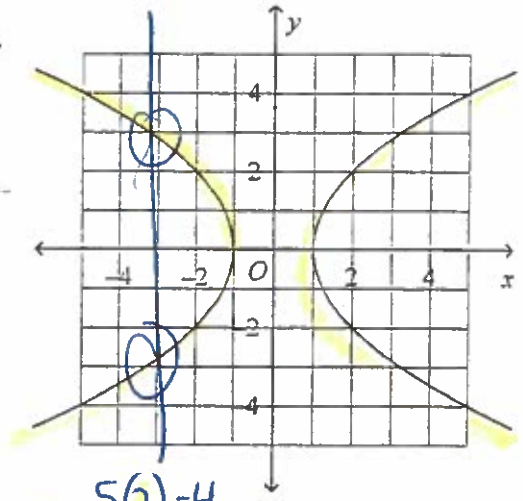
b.



c.



d.



5(2)−4

18. For $f(x) = 5x - 4$, find $f(2)$.

a. −14
b. 6 10−4
c. 14
d. −3

slope

19. Find the point-slope form of the equation of the line passing through the points (7, 1) and (4, 6).

$x_1\ y_1 \quad x_2\ y_2$

$m = \frac{y_2 - y_1}{x_2 - x_1}$

a. $y - 1 = \frac{5}{3}(x - 4)$

b. $y - 1 = \frac{5}{3}(x - 7)$

c. $y - 6 = -\frac{5}{3}(x - 7)$

d. $y - 1 = -\frac{5}{3}(x - 7)$ (y_1, x_1, m)

$y - y_1 = m(x - x_1)$ point-slope

$\frac{6-1}{4-7} = \frac{5}{-3}$

Find an equation for the line:

$x_1\ y_1$

20. through (−6, 1) and parallel to $y = \frac{1}{2}x + 3$.

a. $y = -2x - 11$ b. $y = -\frac{1}{2}x - 2$ c. $y = 2x + 13$ d. $y = \frac{1}{2}x + 4$

$y - 1 = \frac{1}{2}(x + 6)$

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

20.5) Factor. $y^2 + 5y - 24$

$(y + 8)(y - 3)$

Determine whether y varies directly with x. If so, find the constant of variation k and write the equation.

21.

x	y
7	35
21	105
63	315
189	945

$K = \frac{y}{x}$

$y = kx$

a. yes; $k = 5$; $y = 5x$
b. yes; $k = 3$; $y = 3x$
c. yes; $k = 7$; $y = 7x$
d. no

Determine whether y varies directly with x. If so, find the constant of variation k.

22. $-6y = 7x$

$\frac{-6y}{-6} = \frac{7x}{-6}$

$y = -\frac{7}{6}x$

a. yes; $-\frac{7}{6}$
b. yes; $-\frac{6}{7}$
c. yes; 7
d. no

23. The distance traveled at a constant speed is directly proportional to the time of travel. If Olivia traveled 112 miles in 3.5 hours, how many miles will Olivia travel in 8.9 hours at the same constant speed?

a. 99.6 mi
b. 284.8 mi
c. 172.8 mi
d. 124.4 mi

$\frac{112\text{ mi}}{3.5\text{ hr}} = \frac{x}{8.9\text{ hr}}$

24. A 7-mi cab ride costs \$11.70. A 9-mi cab ride costs \$14.50. Find a linear equation that models cost c as a function of distance d.

x_1 y_1 x_2 y_2

a. $c = 1.40d + 1.90$
b. $c = 1.67d + 2.80$
c. $c = 1.61d + 1.90$
d. $d = 1.40c + 2.80$

$(7, \$11.70)$
$(9, \$14.50)$

$m = \frac{14.50 - 11.70}{9 - 7} = \frac{2.8}{2} = 1.4$

$y - 11.70 = 1.4(x - 7)$

$y - 11.70 = 1.4x - 9.8$

$+11.70 \quad +11.70$

$y = 1.4x + 1.90$

Write an equation for the vertical translation.

25. $y = \frac{4}{7}x$; 20 units down

move down

a. $y = \frac{4}{7}x + 20$ up
b. $y = \frac{4}{7}x - 20$ $y = mx + b$
c. $y = \frac{4}{7}(x + 20)$
d. $y = \frac{4}{7}(x - 20)$

25.5) Factor. $2x^2 + 5x - 12$

$2(-12) = -24$

$8 \quad -3$

$2x^2 + 8x - 3x - 12$

$2x(x+4) - 3(x+4)$

$(x+4)(2x-3)$

$x - y \leq 6$

$-x \quad -x$

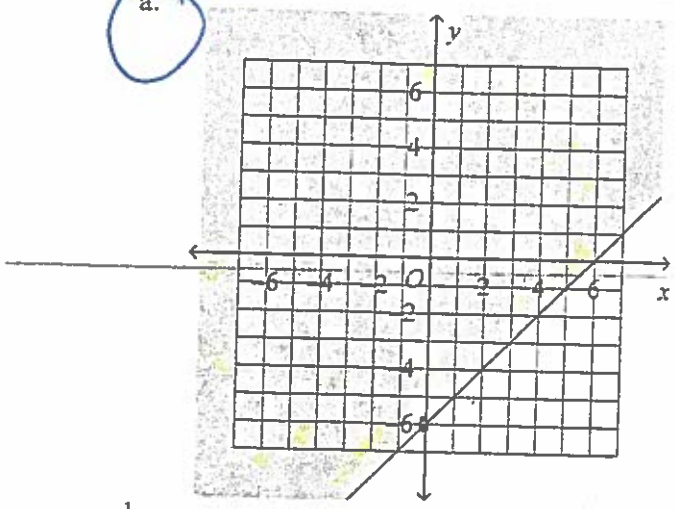
$\frac{-y}{-1} \leq \frac{-x}{-1} + \frac{6}{-1}$

$y \geq 1x - 6$

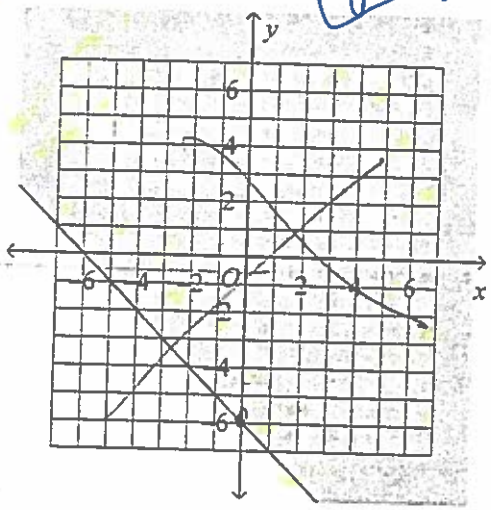
Graph the inequality.

26. $x - y \leq 6$

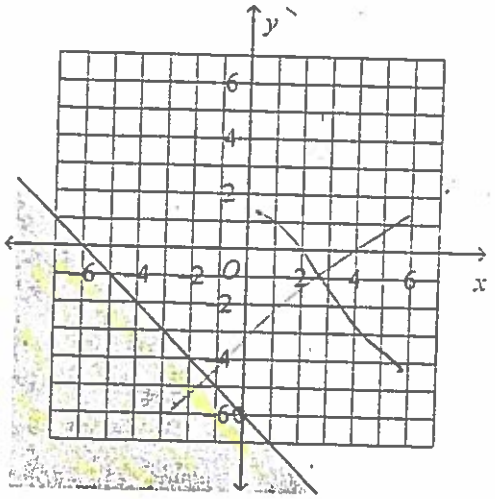
a.



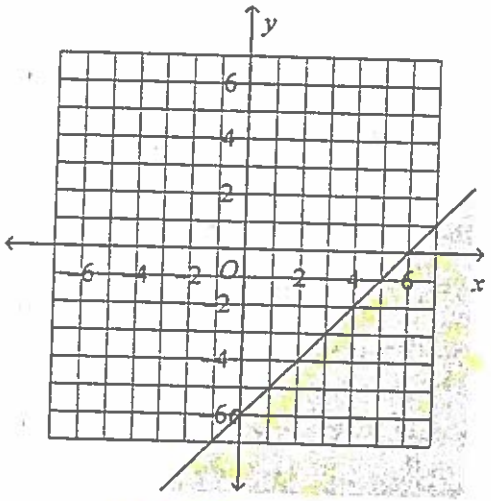
c.



b.



d.



$3 \cdot 2 \cdot x \cdot x \cdot y - 5 \cdot 3 \cdot x \cdot x \cdot y \cdot y$

26.5) Factor. $6x^3y - 15x^2y^2$

GCF

$3x^2y(2x - 5y)$

< > dashed

$x-1=0$
$+1\ +1$
$x=1$ (1, 4)

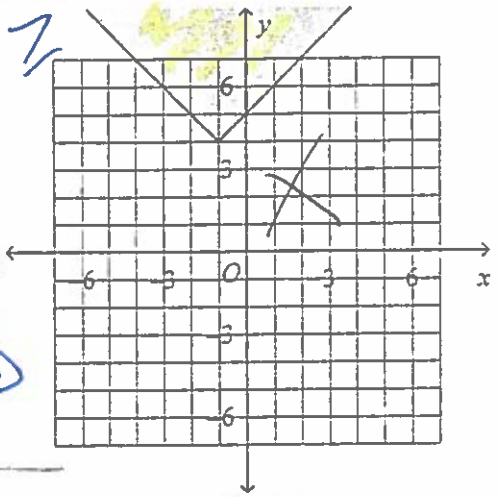
Graph the absolute value inequality.

27. $y \leq |x-1|+4$ solid

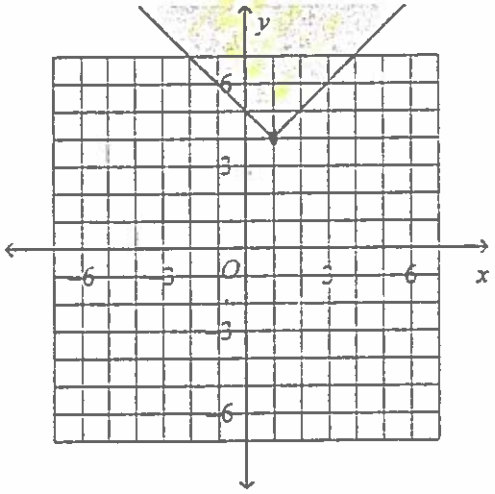
$\leq$

x	
0	5
1	4
2	5

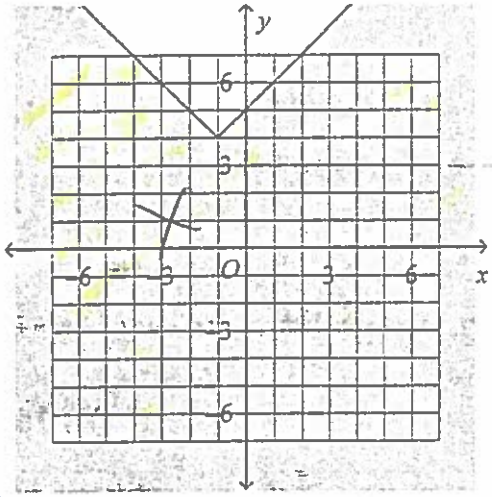
a.



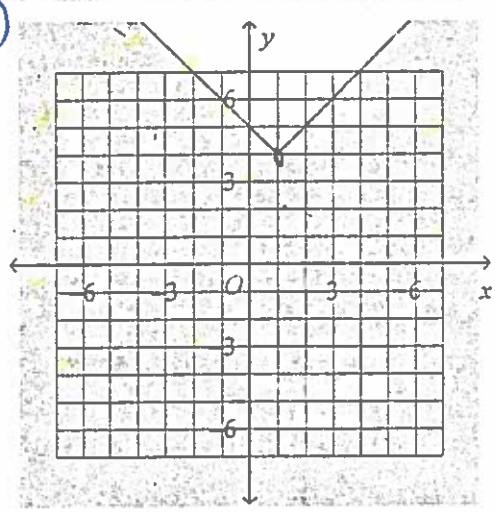
b.



c.



d.



27.5) Factor. x^4+5x^2-6

diff of 2 squares

$(x^2-1)(x^2+6)$

$(x-1)(x+1)(x^2+6)$

-6	
-6	1
-2	3
-3	2
6	-1

x^2+4

$(x+2i)(x-2i)$

28. L_1 L_2 L_3 Stat edit

	A	B	C
1	Month	Revenue	Expenses
2	Jan 1	4000	22,000
3	Feb 2	9000	24,000
4	Mar 3	13,000	25,000
5	Apr 4	16,000	27,000
6	May 5	21,000	30,000

June 6 July 7 August 8

linear regression
L_1, L_2
L_1, L_3

a. The spreadsheet shows the monthly revenue and expenses for a new business. Use your graphing calculator to find a linear model for monthly revenue and a linear model for monthly expenses.

b. Use the models to predict the month in which revenue will equal expenses.

a. **a.** $\begin{cases} R = 4100x - 300 \\ E = 1900x + 19900 \end{cases}$
b. October

b. **a.** $\begin{cases} R = 4100x + 300 \\ E = 1900x + 19900 \end{cases}$
b. September

c. **a.** $\begin{cases} R = 4100x + 300 \\ E = 1900x + 19900 \end{cases}$
b. August

d. **a.** $\begin{cases} R = 4100x - 300 \\ E = 1900x + 19900 \end{cases}$
b. September

Use the elimination method to solve the system.

29. $\begin{cases} 2x + y = -8 \\ 6x + 3y = -24 \end{cases}$ $\cdot -3$

$-6x - 3y = 24$
$6x + 3y = -24$
$0 = 0$

a. $(-2, -7)$
b. $(2, 7)$
c. no solutions $(0 \neq 5)$
d. infinite solutions $(0 = 0)$ $(5 = 5)$

30. $\begin{cases} 2x - 2y + z = -15 \\ 6x - 3y - z = -19 \\ 3x - y - z = -6 \end{cases}$

a. $(1, 8, 0)$
b. $(-3, 2, -5)$
c. $(1, 11, 5)$
d. $(-1, 3, 4)$

Solve the system of inequalities by graphing.

31. $\begin{cases} x \geq 4 \\ y > 0 \end{cases}$

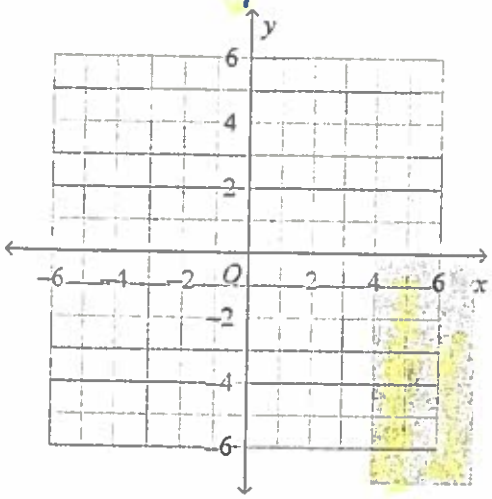
answer choices on next page.

31

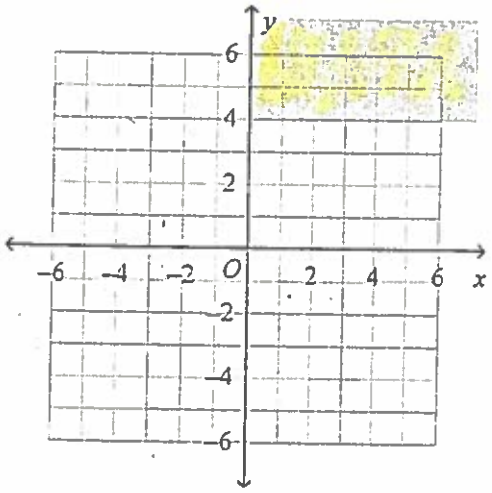
$x \geq 4$

$y > 0$

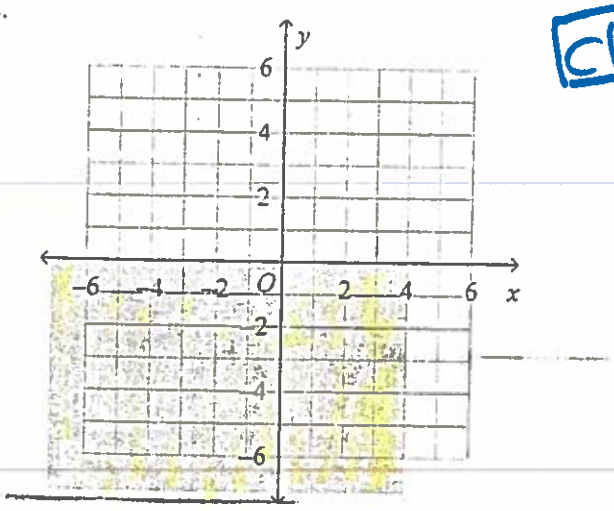
a.

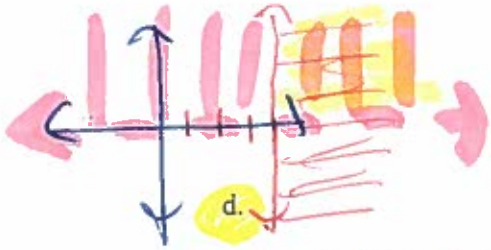


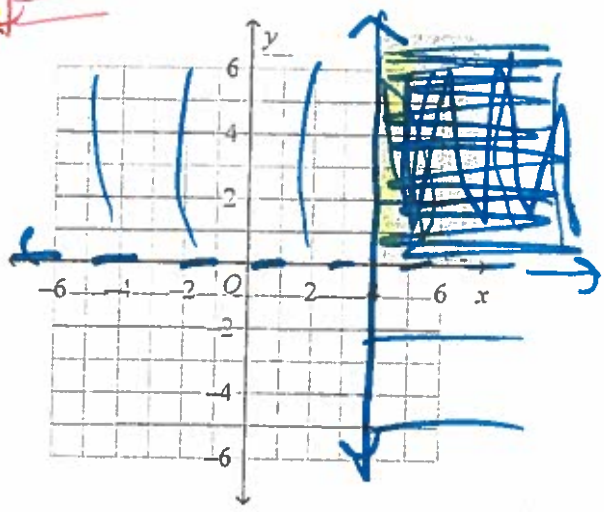
b.



c.







32. The maximum value of a linear objective function ____ occurs at exactly one vertex of the feasible region.
   a. always
   b. sometimes
   c. never

33. Which of the following points lies in the plane represented by $-2x + 7y + 2z = 4$?
   a. (0, 0, 9)
   b. (–2, –7, 10)
   c. (–10, 8, 5)
   d. (4, 4, –8)

Ch.6 sum/diff. of 2 cubes

33.5) Factor

$x^3 - 343$ $(x)^2$ $(7)^2$

$(x-7)(x^2+7x+49)$

$\sqrt[3]{x^3} = x$ $\sqrt[3]{343} = 7$

Find the sum or difference.

34. $\begin{bmatrix} 4 & 7 \\ -5 & 1 \end{bmatrix} - \begin{bmatrix} -3 & -2 \\ 0 & 6 \end{bmatrix}$

a. $\begin{bmatrix} 1 & 5 \\ -5 & 7 \end{bmatrix}$

b. $\begin{bmatrix} 7 & 9 \\ -5 & -5 \end{bmatrix}$

c. $\begin{bmatrix} 7 & 9 \\ -5 & 5 \end{bmatrix}$

d. $\begin{bmatrix} 1 & 5 \\ -5 & 7 \end{bmatrix}$

Solve the matrix equation.

35. $\begin{bmatrix} 5 & -7 \\ 1 & -6 \end{bmatrix} - X = \begin{bmatrix} -2 & 4 \\ 2 & 5 \end{bmatrix}$

a. $\begin{bmatrix} -7 & 11 \\ 1 & 11 \end{bmatrix}$

b. $\begin{bmatrix} 7 & -3 \\ -1 & -11 \end{bmatrix}$

1 - -1

-7 + +3

c. $\begin{bmatrix} 3 & 11 \\ 3 & -1 \end{bmatrix}$

d. $\begin{bmatrix} 7 & -11 \\ -1 & -11 \end{bmatrix}$

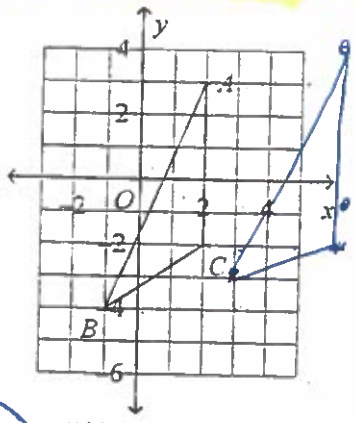
35.5) Factor $x^3 - 3x^2 - 10x$

$x(x^2 - 3x - 10)$

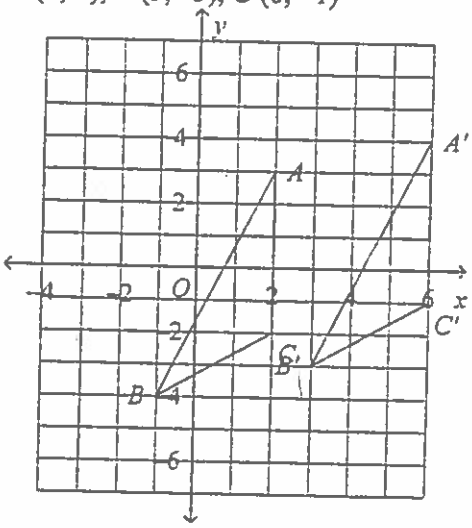
$x(x-5)(x+2)$

The points represent the vertices of a polygon. Use a matrix to find the coordinates of the image after the given transformation. Graph the preimage and the image.

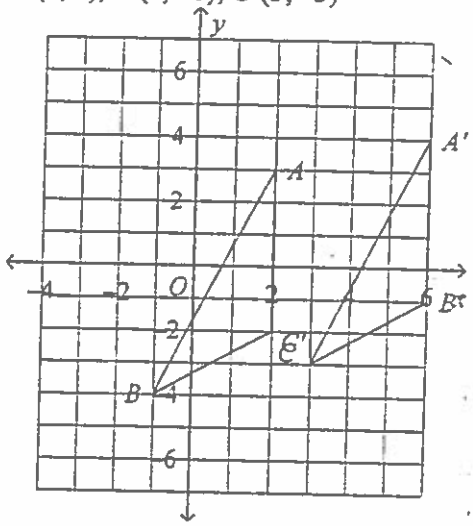
36. $A(2, 3)$, $B(-1, -4)$, and $C(2, -2)$; a translation 4 units right and 1 unit up



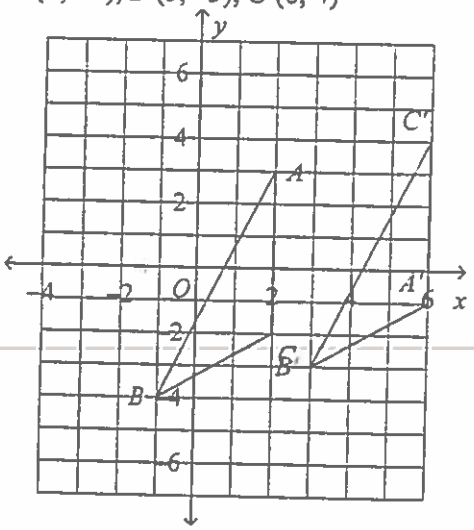
a. $A'(6, 4)$, $B'(3, -3)$, $C'(6, -1)$



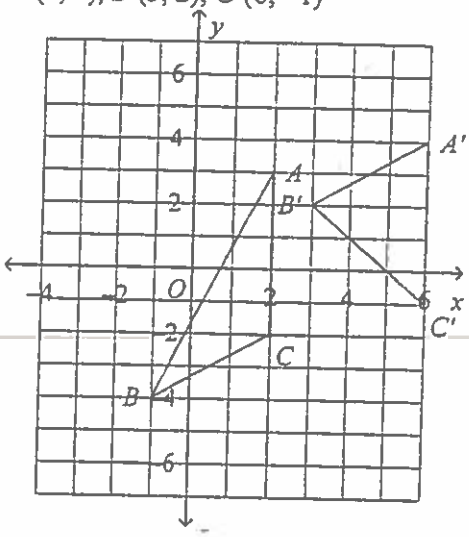
c. $A'(6, 4)$, $B'(6, -1)$, $C'(3, -3)$



b. $A'(6, -1)$, $B'(3, -3)$, $C'(6, 4)$



d. $A'(6, 4)$, $B'(3, 2)$, $C'(6, -1)$



Which of the following is the multiplicative inverse of the given matrix?

37. $\begin{bmatrix} 5 & 2 \\ 12 & 5 \end{bmatrix}$

a. $\begin{bmatrix} 5 & -2 \\ -12 & -5 \end{bmatrix}$ b. $\begin{bmatrix} 5 & 2 \\ 12 & 5 \end{bmatrix}$ c. $\begin{bmatrix} 5 & 2 \\ -12 & 5 \end{bmatrix}$ d. $\begin{bmatrix} 5 & -2 \\ -12 & 5 \end{bmatrix}$

Write the coefficient matrix for the system. Use it to determine whether the system has a unique solution.

38. $\begin{cases} -6x - 6y = -4 \\ -x - y = 3 \end{cases}$

A B

$A^{-1} \cdot B$

$\det[A] = 0$

a. $\begin{bmatrix} -6 & -6 \\ -1 & -1 \end{bmatrix}$; yes

b. $\begin{bmatrix} -6 & -1 \\ -6 & -1 \end{bmatrix}$; no

c. $\begin{bmatrix} -6 & -6 \\ -1 & -1 \end{bmatrix}$; no

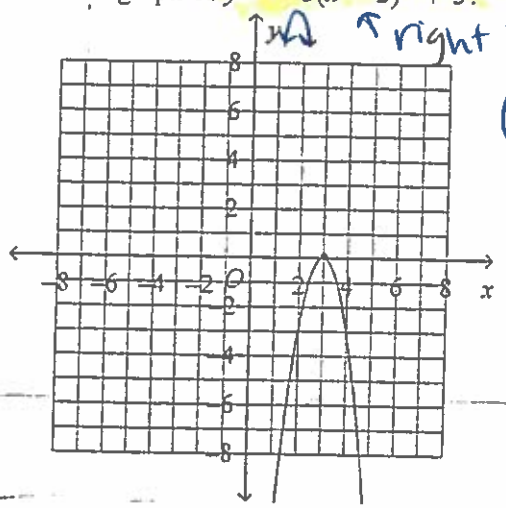
d. $\begin{bmatrix} -4 \\ 3 \end{bmatrix}$; yes

39. Which is the graph of $y = -3(x - 3)^2 + 5$?

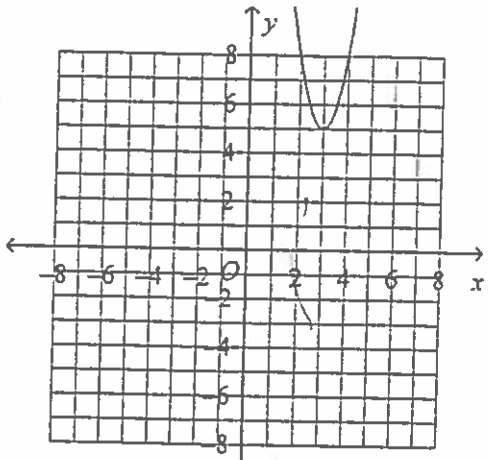
↑ right 3, up 5

(3, 5)

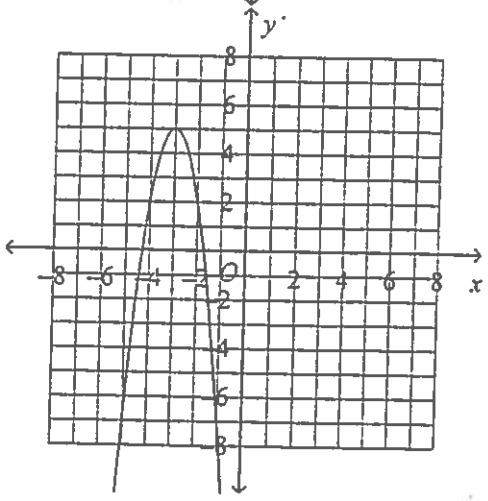
a.



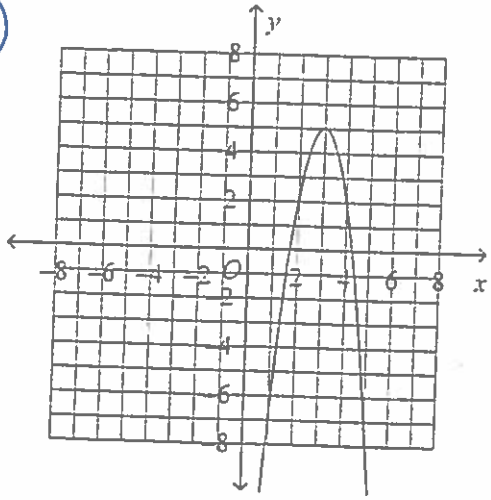
b.



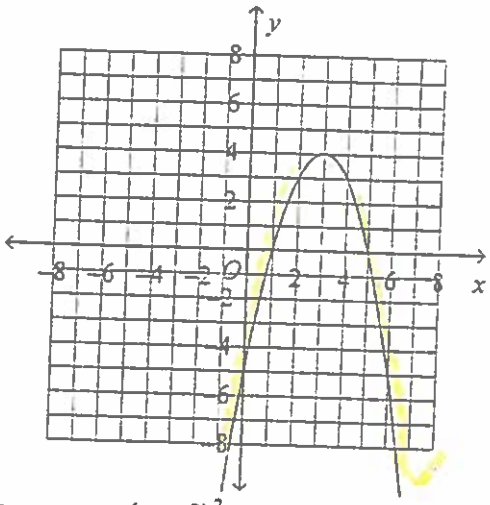
c.



d.



40. Use the vertex form to write the equation of the parabola.



a. $y = -(x + 3)^2 - 4$
b. ~~$y = (x - 3)^2 + 4$~~
c. $y = -(x + 3)^2 + 4$
d. $y = -(x - 3)^2 + 4$ (3, 4)

$x - 3 = 0$
$+3 \quad +3$
$x = 3$

Factor the expression.

41. $9x^2 + 24x + 16$
a. $(3x + 4)(-3x - 4)$
b. $(3x - 4)^2$
c. $(-3x + 4)^2$
d. $(3x + 4)^2$

$(3x+4)(3x+4)$
$9x^2+12x+12x+16$
$9x^2+24x+16$

42. Simplify $\sqrt{-27}$ using the imaginary number i.
a. ~~$3\sqrt{-3}$~~
b. $i\sqrt{27}$
c. ~~$-3\sqrt{3}$~~
d. $3i\sqrt{3}$

$\sqrt{27}$
$\sqrt{9}\sqrt{3}$

43. Use a graphing calculator to ~~determine which~~ type of model best fits the values in the table.

x	−6	−2	0	2	6
y	−12	4	0	−12	−60

a. quadratic model
b. linear model
c. cubic model
d. none of these

44. The table shows the number of llamas born on llama ranches worldwide since 1988. Find a cubic function to model the data and use it to estimate the number of births in 1999.

Years since 1988	1	3	5	7	9
Llamas born (in thousands)	1.6	20	79.2	203.2	416

a. $L(x) = 8.1x^2 - 30.4x + 28.7$; 741,600 llamas
b. $L(x) = 0.5x^3 + 0.6x^2 + 0.3x + 0.2$; 563,200 llamas
c. $L(x) = 0.5x^3 + 0.6x^2 + 0.3x + 0.2$; 741,600 llamas
d. $L(x) = 8.1x^2 - 30.4x + 28.7$; 563,200 llamas

45. $6x = 9 + x^2$

$x^2 - 6x + 9 = 0$

$(x-3)(x-3)$

$x = 3 \quad x = 3$

a. 3 b. –3 c. –3, 3 d. no solution

Evaluate the expression.

46. $8!$

a. 40,320 b. 5040 c. 362,880 d. 64

Add if possible.

47. $3\sqrt{7x} + 5\sqrt{7x}$

a. $8\sqrt{14x}$
b. $56\sqrt{7x}$
c. $8\sqrt{7x}$
d. not possible to simplify

Simplify.

48. $13^{\frac{1}{2}} \cdot 13^{\frac{1}{2}} = 13^1$

$\sqrt{13} \cdot \sqrt{13} = \sqrt{169} = 13$

a. 13 b. $\sqrt{13}$ c. 1 d. $13^{\frac{1}{4}}$

Multiply.

49. $(8 - \sqrt{2})(9 + \sqrt{5})$

a. $72 - \sqrt{10}$
b. $72 + 8\sqrt{5} - 9\sqrt{2} - \sqrt{10}$
c. $72 - 2\sqrt{10}$
d. $72 - \sqrt{3} - \sqrt{10}$

50. Write the exponential expression $3x^{\frac{3}{8}}$ in radical form.

$(3x)^{3/8}$

a. $3\sqrt[8]{x^3}$
b. $\sqrt[8]{3x^3}$
c. $3\sqrt[3]{x^8}$
d. $3^{\frac{3}{8}}\sqrt[8]{x^3}$

$3x^{\frac{3}{8}}$

51. Let $f(x) = 3x + 2$ and $g(x) = x - 3$. Find $f(x) - g(x)$.

a. $2x - 5$
b. $2x + 5$
c. $4x - 1$
d. $2x - 1$

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

52. Let $f(x) = 4 + 5x$ and $g(x) = 2x - 1$. Find $f(g(x))$ and $g(f(x))$.

a. $f(g(x)) = 10x - 1$; $g(f(x)) = 10x + 7$
b. $f(g(x)) = 7x + 3$; $g(f(x)) = 10x + 7$
c. $f(g(x)) = -7x - 3$; $g(f(x)) = -10x + 7$
d. $f(g(x)) = -10x - 7$; $g(f(x)) = 7x + 3$

$f(g(x))$
$4 + 5(2x-1)$
$4 + 10x - 5$
$10x - 1$

$g(f(x))$
$2(4+5x) - 1$

Write the equation in logarithmic form.

53. $125^{\frac{4}{3}} = 625$

a. $\log_{\frac{4}{3}} 625 = 125$
b. $3 \log_4 625 = 125$
c. $\log_{125} 625 = \frac{4}{3}$
d. $\log_{625} 125 = \frac{3}{4}$

Write the expression as a single logarithm.

54. $\log_2 54 - \log_2 9$

a. $\log_2 45$
b. $\log_2 6$
c. $\log 45$
d. $\log 6$

Expand the logarithmic expression.

55. $\log_3 \frac{p}{2}$

a. $-p \log_3 2$
b. $\frac{\log_3 p}{\log_3 2}$
c. $\log_3 p - \log_3 2$
d. $\log_3 2 - \log_3 p$

56. Use the Change of Base Formula to solve $9^{5x} = 22$. Round to the nearest ten-thousandth.

a. 0.8741
b. 7.0340
c. 4.4691
d. 0.2814

57. Solve $\log(6x + 4) = 3$.

a. $\frac{500}{3}$
b. 996
c. 166
d. $-\frac{1}{6}$

Find the opposite and the reciprocal of the number.

58. 500

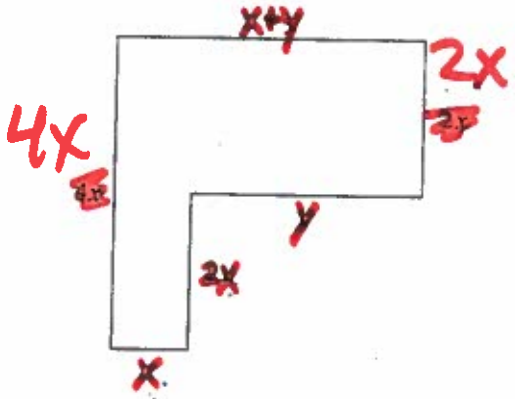
a. $-500, -\frac{1}{500}$

b. $-500, \frac{1}{500}$

c. $500, \frac{1}{500}$

d. $500, -\frac{1}{500}$

59. Find the perimeter of the figure. Simplify the answer.



a. $9x + 2y$

b. $10x + y$

c. $10x + 2y$

d. $9x + 3y$

60. If $a = b$, then $a - c$ ____ equals $b - c$.

a. always

b. sometimes

c. never

Solve the equation or formula for the indicated variable.

61. The formula for the time a traffic light remains yellow is $t = \frac{1}{8}s + 1$, where t is the time in seconds and s is the speed limit in miles per hour.

a. Solve the equation for s.

b. What is the speed limit at a traffic light that remains yellow for 4.5 seconds?

a. $s = 8t - 8$; $s = 28$ mi/h

b. $s = 8t$; $s = 36$ mi/h

c. $s = 8t - 1$; $s = 35$

d. $s = \frac{1}{8}t - 1$; $s = 28$ mi/h

62. The sides of a triangle are in the ratio 3 : 4 : 5. What is the length of each side if the perimeter of the triangle is 90 cm?

a. 10.5 cm, 11.5 cm, and 12.5 cm

b. 22.5 cm, 30 cm, and 37.5 cm

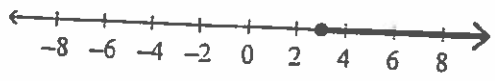
c. 7.5 cm, 11.5 cm, and 32.1 cm

d. 19.3 cm, 25.7 cm, and 32.1 cm

Solve the inequality. Graph the solution set.

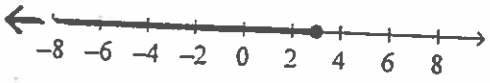
63. $2 + 2k \leq 8$

a. $k \geq 3$

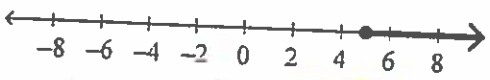


b. $k \leq 5$

c. $k \leq 3$



d. $k \geq 5$



64. The perimeter of a square garden is to be at least 22 feet but not more than 36 feet. Find all possible values for the length of its sides.

a. $11 < x < 18$

b. $5.5 < x < 9$

c. $5.5 \leq x \leq 9$

d. $11 \leq x \leq 18$

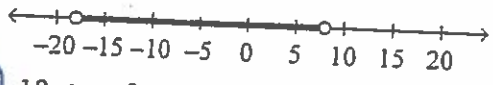
Solve the inequality. Graph the solution.

65. $|2x + 10| < 26$

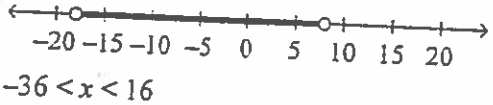
$-26 < 2x + 10 < 26$

$-10 \quad -10 \quad -10$

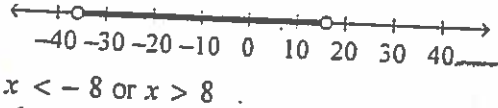
a. $-18 > x > 8$



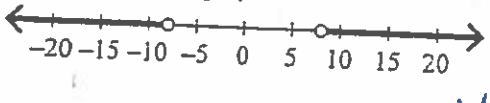
b. $-18 < x < 8$



c. $-36 < x < 16$



d. $x < -8$ or $x > 8$



$\frac{-36}{2} < \frac{2x}{2} < \frac{16}{2}$

$-18 < x < 8$

66. Lynn and Dawn tossed a coin 60 times and got heads 33 times. What is the experimental probability of tossing heads using Lynn and Dawn's results?

a. $\frac{20}{11}$

b. $\frac{9}{20}$

c. $\frac{11}{20}$

d. $\frac{9}{11}$

67. A spinner is numbered from 1 through 10 with each number equally likely to occur. What is the probability of obtaining a number less than 2 or greater than 7 in a single spin?

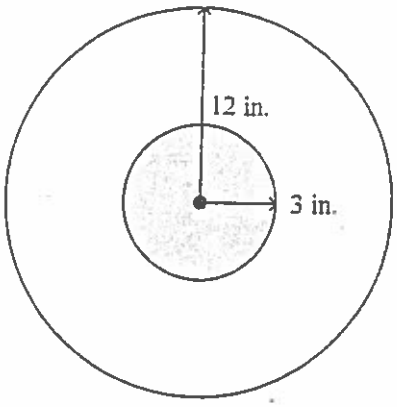
a. $\frac{2}{5}$

b. $\frac{1}{2}$

c. $2\frac{1}{2}$

d. $\frac{3}{10}$

68. If a dart hits the target at random, what is the probability that it will land in the shaded region?



Drawing not to scale

a. $\frac{1}{4}$

b. $\frac{1}{16}\pi$

c. $\frac{1}{16}$

d. 16π

69. Suppose $f(x) = 4x - 2$ and $g(x) = -2x + 1$.

Find the value of $\frac{f(5)}{g(-3)}$.

a. $1\frac{5}{9}$

b. $2\frac{4}{7}$

c. -2

d. 2

Multiply and simplify if possible.

74. $\sqrt{6} \cdot \sqrt{2}$

a. $2\sqrt{3}$

b. $\sqrt{12}$

c. $3\sqrt{2}$

d. not possible

70. Classify $-3x^5 - 2x^3$ by degree and by number of terms.

a. quintic binomial

b. quartic binomial

c. quintic trinomial

d. quartic trinomial

71. Write the expression $(x + 6)(x - 4)$ as a polynomial in standard form.

a. $x^2 - 10x + 2$

b. $x^2 + 10x - 24$

c. $x^2 + 2x - 24$

d. $x^2 + 10x - 10$

72. Divide $3x^3 - 3x^2 - 4x + 3$ by $x + 3$.

a. $3x^2 - 12x + 32$

b. $3x^2 - 12x + 32$, R -93

c. $3x^2 + 6x - 40$

d. $3x^2 + 6x - 40$, R 99

73. The formula for the volume of a sphere is $V = \frac{4}{3}\pi r^3$. Find the radius, to the nearest hundredth, of a sphere with a volume of 15 in.^{3}.

a. 3.58 in.

b. 258.01 in.

c. 1.53 in.

d. 1.85 in.

75. Let $f(x) = 3x + 2$ and $g(x) = 7x + 6$. Find $f \cdot g$, and its domain.

a. $6x^2 + 4x + 42$; all real numbers except $x = -\frac{2}{3}$

b. $6x^2 + 4x + 42$; all real numbers

c. $21x^2 + 32x + 12$; all real numbers

d. $21x^2 + 32x + 12$; all real numbers except $x = -\frac{6}{7}$

(76) Find the inverse $y = 2x^2 - 5$

$x = 2y^2 - 5$
$+5 \quad +5$
$\frac{x+5}{2} = \frac{2y^2}{2}$
$\sqrt{\frac{x+5}{2}} = \sqrt{y^2}$
$y = \pm\sqrt{\frac{x+5}{2}}$

(77) Find the rational roots of
$x^4 - 2x^3 - 7x^2 + 18x - 18 = 0$

(78) Simplify $\sqrt[3]{108x^{12}y^{16}}$

Day 86

(79) Divide using synthetic ÷.
$(x^3 + x^2 + x - 14) \div (x + 2)$

-2	1	1	1	-14
		-2	2	-6
	1	-1	3	-20

$x^2 - 1x + 3$ R -20

(80) Find the missing value by completing the square.
$x^2 + 6x + \boxed{9}$ $\left(\frac{1}{2} \cdot 6\right)^2$
$3^2 = 9$

Day 87

(81) Solve by quadratic formula.
$2x^2 - 7x + 8 = 0$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

(82) $f(x) = 9x - 7$
Find $f(-5)$.
$9(-5) - 7$
$-45 - 7$
-52

(83) Solve. $\sqrt{2x+3} - 4 = 3$

(84) Solve. $(x+5)^{\frac{2}{3}} = 4$

(85) Simplify. $8^{\frac{1}{2}} \cdot 8^{\frac{1}{2}} = 8^1 = 8$

(86) Simplify.
$9\sqrt{2}x + 3\sqrt{2}x$
$11\sqrt{2x}$

(87) Simplify
$\sqrt{-96}$

(88) $(3 + \sqrt{2})(7 - \sqrt{5})$