# CUMULATIVE REVIEW

(Chapters 1, 2, 3, 5, 6)

## Chapter 1

1. Solve $|2x+6| \leq 4$

2. Solve and graph the solution set: $4x-10<-10$ *or* $6x+4 \geq 10$

3. Solve and graph the solution set: $12 \leq 3x+3 \leq 21$

4. Solve $|3x+7| \geq 26$

5. Simplify $3+21 \div 7-8 \div 4$

6. Solve $2|2y-6|=4$

7. Evaluate $\frac{a}{b^2}+c$ if $a=-9, b=\frac{2}{3}, c=8$

8. To what sets of numbers does 10 belong?

Solve for $x$:

9. $tx-ux=3t$

10. $\frac{x-3}{6}+3=a$

11. $\frac{x-2}{2}=m+n$

12. $A=\frac{1}{2}h(x+b_2)$

13. $\frac{3}{4}(x+1)=g$

## Chapter 2

14. Graph $y=|x+4|$

15. Graph $x-2y<1$

16. If $f(x)=x^3-3x^2+2x+5$, find $f(2)$

17. Find the slope of the line that passes through (2, –3) and (–1, 6)

18. State the domain of the following relation and then tell if it is a function:
{(3, 2), (2, 2), (–1, 5), (0, 0)}

19. Write the equation of a line that has a slope of 3 and passes through (3, 4)

20. Write the equation of a line that is perpendicular to $y=\frac{2}{3}x+4$ and passes through (–2, 1)

21. Graph $f(x) = |x| - 2$

22. Graph $g(x) = \begin{cases} x & if \quad x < 0 \\ 2 & if \quad x = 0 \\ x - 1 & if \quad x > 0 \end{cases}$

**Chapter 3**

Solve each system of linear equations:

23. $\begin{cases} 5x + 3y = -4 \\ 7x - y = 36 \end{cases}$ 24. $\begin{cases} 7x + y = 9 \\ 5x - y = 15 \end{cases}$ 25. $\begin{cases} 5x - 3y = 19 \\ 7x + 2y = 8 \end{cases}$ 26. $\begin{cases} 8x + 3y = 5 \\ 6x - 2y = -9 \end{cases}$

27. Solve $\begin{cases} y + 2z = 5 \\ 7x - 3y + z = 20 \\ 2z = 8 \end{cases}$

28. Solve $\begin{cases} x + 2y - z = 1 \\ x + 3y + 2z = 7 \\ 2x + 6y + z = 8 \end{cases}$

29. Denim Duds makes denim jackets and jeans. Each garment must be cut from a pattern and sewn. There are 40 worker hours per day available for cutting and 52 hours per day for sewing. The jacket requires 1 hour of cutting and 4 hours of sewing. The jeans require 2 hours of cutting and 2 hours of sewing. If the profit of the jacket is $14.00 and the profit of the jeans is $8.00, how many of each should be made be made to maximize profit?

**Chapter 5**

30. Given $y = x^2 + 4x + 1$
    a. Graph
    b. State the vertex
    c. State the axis of symmetry
    d. What is the maximum or minimum value?

31. Which way does the parabola $y = -\frac{1}{2}x^2 - 4x + 12$ open?

32. State the vertex of $y = -3(x - 2)^2 - 4$

33. Write $y = x^2 + 6x - 2$ into vertex form

Factor the following:

34. $6x^2 + 13x + 6$ 35. $x^2 - 5x + 6$ 36. $x^2 + 3x - 10$

37. $3x^3 - 3x$ 38. $x^3 - 8$ 39. $x^4 - 2x^2 - 8$

40. Solve by factoring: $2x^2 - 11x = -15$

41. Solve by competing the square: $x^2 - 3x = 28$

42. Solve by the quadratic formula: $2x^2 + 8x + 12 = 0$

Solve by any method over {Complex}:

43. $x^2 + 12 = 0$

44. $x^2 + 2x = -5$

45. $9x^2 + 12x = 5$

46. $x^3 + 64 = 0$

Simplify the following:

47. $(2 + 3i) + (5 - 2i)$

48. $-2i(4 - i)$

49. $(3 + i)(2 + 3i)$

50. $(4 - 3i)(4 + 3i)$

**Chapter 6**

51. State the type and number of solutions to $x^2 + 5x + 5 = 0$

52. State the degree of $x^4 + 5x^3 - 2x + 7$

53. Simplify $(3x^2 + 2x - 4) + (x^3 - x^2 - 2x - 5)$

54. Simplify $(3x^2 + 2x - 4) - (x^3 - x^2 - 2x - 5)$

55. Multiply $5x^2(x - 4)$

56. Multiply $(x^3 + 2)^2$

57. Find the zeros of $y = (x - 2)(x + 3)(x + 1)$

58. Write in factored form: $y = x^4 + 3x^3 + 2x^2$

59. Divide $(x^3 + 3x^2 - 6x - 7)$ by $(x + 4)$ and state whether $(x + 4)$ is a factor of the polynomial

60. If $P(x) = x^4 - 3x^3 + 2x^2 + x - 4$, find $P(2)$

61. Solve $x^4 - 2x^2 - 8 = 0$

62. If $P(x)$ is a polynomial with rational coefficients where $2i$ and $3-\sqrt{5}$ are roots, what are two additional roots?

63. List all possible rational roots of $3x^4 - 7x^3 + 2x^2 + x - 4 = 0$

64. Find all the zeros of $y = x^3 - 3x^2 - x + 3$

65. If $(x+1)$ is a factor of $(x^3 - 3x^2 - x + 3)$, what are the other factors?

66. Write an equation with real coefficients that has roots 4 and $(2+i)$

67. A group of 9 students are to make a presentation on 3 issues. In how many ways can this assignment be made?

68. A traveler can visit 4 of 6 cities. In itinerary for the trip is a list of the 4 cities in the order to be visited. How many different itineraries are there for the trip?

69. Expand $(2x+3)^4$

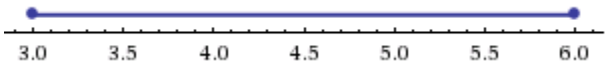
70. Find the 5th term of $(x-2y)^{12}$

## ANSWERS

1. $-5 \le x \le -1$

2. $x < 0 \text{ or } x \ge 1$


3. $3 \le x \le 6$




4. $x \ge \frac{19}{3} \text{ or } x \le -11$

5. 4

6. $y$ = 4 or 2

7. $-\frac{49}{4}$

8. {Real}, {Rational}, {Integer}, {Whole}, {Natural}

9. $x = \frac{3t}{t-u}$

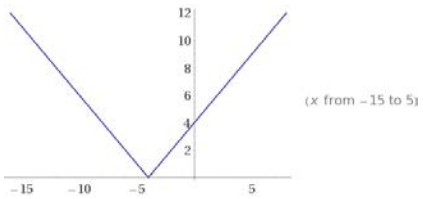
10. $x = 6a - 15$

11. $x = 2m + 2n + 2$

12. $x = \frac{2A}{h} - b_2$

13. $x = \frac{4}{3}g - 1$

14.



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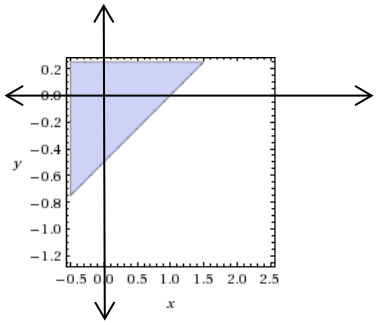



16. $f(2) = 5$

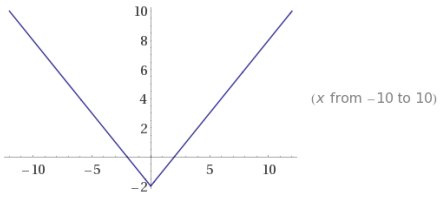
17. $m = -3$

18. D = {–1, 0, 2, 3}; Yes

19. $y - 4 = 3(x - 3)$ *or* $y = 3x - 5$ *or* $3x - y = 5$

20. $y - 1 = -\frac{3}{2}(x + 2)$ *or* $y = -\frac{3}{2}x - 2$ *or* $3x + 2y = -4$

21.

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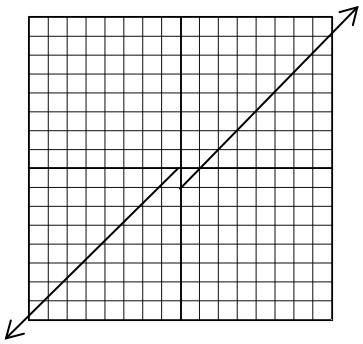


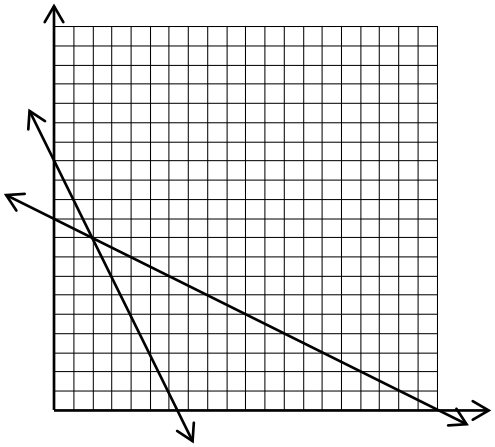
23. (4, –8) 24. (2, –5) 25. (2, –3) 26. $(-\frac{1}{2}, 3)$

27. (1, –3, 4)

28. (3, 0, 2)

29. $x$ = number of jackets, $y$ = number of jeans

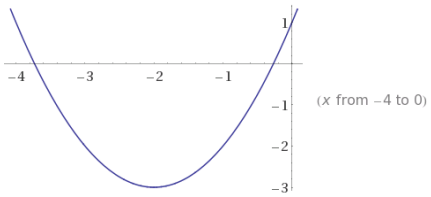
$x \geq 0 \quad y \geq 0 \quad x + 2y \leq 40 \quad 4x + 2y \leq 52$



$P = 14x + 8y$

The company should make 4 jackets and 18 jeans to get a maximum profit of $200

30. a.




b. (–2, –3)
c. $x = -2$
d. Minimum value of –3

31. Down

32. (2, –4)

33. $y = (x+3)^2 - 11$

34. $(2x+3)(3x+2)$ 35. $(x-3)(x-2)$ 36. $(x-2)(x+5)$

37. $3x(x-1)(x+1)$ 38. $(x-2)(x^2+2x+4)$ 39. $(x-2)(x+2)(x^2+2)$

40. $x = 3 \text{ or } \frac{5}{2}$

41. $x = -4 \text{ or } 7$

42. $x = -2 \pm i\sqrt{2}$

43. $x = \pm 2i\sqrt{3}$

44. $x = -1 \pm 2i$

45. $x = -\frac{5}{3}, \frac{1}{3}$

46. $x = -4, 2 \pm 2i\sqrt{3}$

47. $7 + i$

48. $-2 - 8i$

49. $3 + 11i$

50. 25

51. D = 5; 2 real solutions

52. 4

53. $x^3 - 2x^2 - 9$

54. $-x^3 + 4x^2 + 4x + 1$

55. $5x^3 - 20x^2$

56. $x^6 + 4x^3 + 4$

57. zeros = $2, -1, -3$

58. $x^2(x+2)(x+1)$

59. $x^2 - x - 2 + \frac{1}{x+1}$; $(x+4)$ is not a factor

60. $-2$

61. $x = \pm 2, \pm i\sqrt{2}$

62. $-2i$ and $3 + \sqrt{5}$

63. $\pm 1, \pm 2, \pm 4, \pm\frac{1}{3}, \pm\frac{2}{3}, \pm\frac{4}{3}$

64. $\pm 1, 3$

65. $(x-3)$ and $(x-1)$

66. $x^3 - 8x^2 + 21x - 20 = 0$

67. 84

68. 360

69. $16x^4 + 96x^3 + 216x_2 + 216x + 81$

70. $7920x^8y^4$