

MAT 0020 BASIC ALGEBRA II



COMPREHENSIVE REVIEW

- 1) Simplify: $6 - 18 \div 9 - 4$
A) 19 B) 34
C) 7 D) 0
- 2) Simplify: $20 - 18 \div 2 \times 3 + 5$
A) 8 B) 2
C) -2 D) 22
- 3) Simplify: $4(-5)^2 - (-9 - 6)$
A) -85 B) 115
C) 85 D) 55
- 4) Simplify: $(4 - 9)^2 \cdot 3 \div 5$
A) -15 B) 3
C) 15 D) -55
- 5) Simplify: $(-2)^2 + 2 \cdot 5 - (4 + 2 \cdot 3)$
A) 4 B) -4
C) 12 D) 0
- 6) Simplify: $28 - 8^2 \div (14 - 6) \cdot 6$
A) 76 B) 40
C) 16 D) -20
- 7) Simplify: $6 - (8 - 20) \div 4 \times 2^3$
A) 30 B) 21
C) 4 D) -16
- 8) Simplify: $|-6| + |4| - |-8|$
A) 18 B) 2
C) -10 D) -18
- 9) Simplify: $-|-9| + |6|$
A) 54 B) 15
C) -3 D) 3
- 10) Simplify: $|8 + (-14)| + |-9|$
A) -15 B) -3
C) 15 D) 3
- 11) Simplify: $-2(z + 3) + 4z - 5$
A) $2z - 11$ B) $-2z - 11$
C) $2z + 11$ D) $2z + 1$
- 12) Simplify: $3(2x - 5) - 4(x + 2)$
A) $-10x - 17$ B) $2x - 23$
C) $10x - 23$ D) $2x - 17$
- 13) Simplify: $-6[6(x + 5) + x]$
A) $42x - 180$ B) $30x + 180$
C) $-42x - 180$ D) $42x + 180$
- 14) Simplify: $-2[6 - 3(5 + 3x) - 7x]$
A) $18 + 32x$ B) $16x + 18$
C) $18 - 18x$ D) $-30 - 4x$
- 15) Simplify: $2[(8x - 3x) - (12x + 9)]$
A) $5x - 11$ B) $-14x - 18$
C) $4x + 7$ D) $-4x - 33$
- 16) Evaluate: $b^2 - 4ac$
when $a = -1$, $b = 2$, and $c = -2$.
A) 4 B) -12
C) -4 D) 12

17) Evaluate: $2x^2 - xy - yz^3$
given $x = -4$, $y = 3$, and $z = -2$.

- A) 49 B) 33
C) 25 D) 68

18) Evaluate: $3 + 5w - 6w^2$
given $w = -3$.

- A) -42 B) -66
C) 42 D) 66

19) Evaluate: $x^2 - 2xy + 3y^2$
given $x = -2$ and $y = -1$

- A) 3 B) -3
C) -5 D) -11

20) Solve for x: $-2x + 5 = 8x - 5$

- A) 1 B) 0
C) $-5/3$ D) -2

21) Solve for r: $3(4r + 1) = 11r - 6$

- A) 3 B) -3
C) -5 D) -9

22) Solve for z: $2(3z + 4) = 3(z - 5)$

- A) $-7/3$ B) -3
C) $-23/3$ D) $-13/3$

23) Solve for y: $0.6(2y - 6) - 5y = 0.4(3y - 4)$

- A) 0.4 B) -0.4
C) 4 D) -4

24) Solve for b: $\frac{1}{3}b - \frac{3}{4}b = 3$

- A) 36 B) $5/12$
C) $-3/5$ D) $-36/5$

25) Solve for y: $\frac{5}{16}y + \frac{3}{8}y = 2 + \frac{1}{4}y$

- A) $32/7$ B) $2/7$
C) 32 D) $7/2$

26) Solve for q: $6n - 5q = 3r$

- A) $q = 3r - 6n + 5$ B) $q = \frac{6n - 3r}{5}$
C) $q = 3r + 6n - 5$ D) $q = \frac{3r - 6n}{5}$

27) Solve for y: $4x + 7y = 6$

- A) $y = 6 - 4x$ B) $y = \frac{6 + 4x}{7}$
C) $y = \frac{6 - 4x}{7}$ D) $y = -4x - 1$

28) Solve for c: $4a + 9c - 13 = 0$

- A) $c = \frac{13}{9} - 4a$ B) $c = \frac{4a - 13}{9}$
C) $c = -13 - 4a + 9$ D) $c = \frac{13 - 4a}{9}$

29) Solve the inequality: $8y - 5 > 17 - 5y$

- A) $y > \frac{22}{13}$ B) $y > -\frac{22}{13}$
C) $y < \frac{22}{13}$ D) $y < -\frac{22}{13}$

30) Solve the inequality: $14x + 4 \leq 26x + 20$

- A) $x \geq \frac{4}{3}$ B) $x \leq \frac{4}{3}$
C) $x \geq -\frac{4}{3}$ D) $x \leq -\frac{4}{3}$

31) Solve the inequality: $2(8 - 3x) < 5$

- A) $x < \frac{11}{6}$ B) $x > \frac{11}{6}$
C) $x < -\frac{11}{6}$ D) $x > -\frac{11}{6}$

32) Solve the inequality: $3(x - 2) \geq 5x + 4$

A) $x \leq -\frac{5}{2}$ B) $x \leq -5$

C) $x \geq -5$ D) $x \geq -\frac{5}{2}$

33) Translate into an equation: "Two more than a number is 4 less than three times the number."

A) $2 + x = 4 - 3x$

B) $x + 2 = 4 + 3x$

C) $x + 2 = 3x - 4$

D) $2 + x = 3x + 4$

34) Translate into an equation: "The product of five and a number is equal to three more than twice the number."

A) $5 + n = 3 + n^2$

B) $5n = 3 + n^2$

C) $5 + n = 3 + 2n$

D) $5n = 3 + 2n$

35) Translate into an equation. "Five less than the square of a number is four times the sum of the number and two."

A) $2x - 5 = 4x + 2$

B) $5 - 2x = 4(x + 2)$

C) $x^2 - 5 = 4(x + 2)$

D) $5 - x^2 = 4x + 2$

36) The length of a rectangle is 10 feet more than twice the width. The perimeter of the rectangle is 74 feet. What is the length?

A) 16 feet

B) 42 feet

C) 28 feet

D) 9 feet

37) A 9-foot board is cut into two pieces so that one piece is 5 feet longer than three times the shorter piece. Find the length of both pieces.

A) 3 feet, 6 feet

B) 1 foot, 8 feet

C) 2 feet, 7 feet

D) 4 feet, 5 feet

38) The number of women attending a math class was 9 less than twice the number of men. If a total of 63 students attended the class, how many were women?

A) 24 women

B) 30 women

C) 39 women

D) 32 women

39) A business committee has 45 members. The number of men is 5 more than four times the number of women. Find the number of men on the committee.

A) 37 men

B) 8 men

C) 10 men

D) 35 men

40) Substitute the given values into the formula and solve for the unknown variable:

$I = PRT$, $I = 360$, $P = 2000$, $R = 0.06$

A) 240

B) 24

C) 30

D) 3

41) A statistics class started the semester with 40 students. By midterms, 25 students remained. What percent of students dropped the class?

A) 62.5%

B) 40%

C) 60%

D) 37.5%

42) Find the proportion that solves this problem:

A paint formula requires 6 ounces of dye for every 19 ounces of base paint. How many ounces of dye are required for 95 ounces of base paint?

A) $\frac{19}{6} = \frac{x}{95}$

B) $\frac{19}{6} = \frac{95}{x}$

C) $\frac{6}{19} = \frac{95}{x}$

D) $\frac{6}{x} = \frac{95}{19}$

43) Simplify: $-3x(xy)^0$

A) $-3x^2$

B) -3

C) $-3x$

D) 1

44) Simplify: $\frac{-6x^4y}{12x^3y^5}$

- A) $\frac{x}{6y^4}$ B) $\frac{-x}{2y^4}$
 C) $\frac{-xy^6}{2}$ D) $\frac{x}{18y^5}$

45) Simplify: $\frac{p^{-5}q^{-3}}{p^5q^5}$

- A) $\frac{p^{10}}{q^8}$ B) $\frac{1}{p^{10}q^8}$
 C) $p^{10}q^8$ D) $\frac{q^8}{p^{10}}$

46) Simplify: $(3a^2b^3)^2$

- A) $6a^4b^5$ B) $6a^4b^6$
 C) $9a^4b^5$ D) $9a^4b^6$

47) $(m^2n^{-4}p^0)^{-3}$

- A) $m^{-1}n^{-7}p^{-3}$ B) $\frac{n^{12}}{m^6p^3}$
 C) $\frac{n^{12}}{m^6}$ D) $\frac{m^6}{n^{12}}$

48) Simplify: $x^{-9} \cdot x^4 \cdot 2x^0$

- A) $\frac{2}{x^5}$ B) $\frac{1}{2x^{36}}$
 C) $\frac{2}{x^{13}}$ D) $\frac{1}{2x^5}$

49) Simplify: $(a^2b^4)^3(a^3b^4)$

- A) $a^{10}b^{12}$ B) a^9b^{16}
 C) a^6b^{16} D) a^6b^{12}

50) Simplify: $(x^{-3}yz^0)(x^4y^{-4}z^3)$

- A) $\frac{1}{x^{12}y^4}$ B) xy^3z^3
 C) $\frac{xz^3}{y^3}$ D) $\frac{xz^9}{y^9}$

51) Convert to scientific notation: 123,700

- A) 1237×10^2 B) 1.237×10^{-5}
 C) 12.37×10^4 D) 1.237×10^5

52) Convert to scientific notation: 0.0000415

- A) 4.15×10^{-6} B) 4.15×10^{-5}
 C) 4.15×10^{-4} D) 4.15×10^5

53) Convert to standard form: 2.483×10^6

- A) 24,830 B) 248,300
 C) 2,483,000 D) 0.0002483

54) Convert to standard form: 3.25×10^{-3}

- A) 0.000325 B) 0.00325
 C) 3250 D) 325,000

55) Add: $(2x^2 - 3x - 5) + (-4x^2 + 5x - 2)$

- A) $-2x^2 + 2x - 7$
 B) $-2x^4 + 2x^2 + 10$
 C) $2x^2 - 2x + 3$
 D) $-8x^4 - 15x^2 + 10$

56) Subtract: $(x^2 + 2x - 5) - (3x^2 + x - 6)$

- A) $-2x^2 + x - 11$
 B) $-2x^4 + 3x^2 - 11$
 C) $-2x^2 + x + 1$
 D) $-2x^4 + x^2 + 1$

57) Multiply: $-6x^2y(3x^3 - 2y)$

- A) $-18x^5y + 12x^2y^2$
 B) $-18x^6y + 12x^2y$
 C) $-18x^5y - 12x^2y^2$
 D) $-6x^7y^3$

58) Multiply: $2x^3y^2(5x^2 - 2xy + 3)$

- A) $10x^6y^2 + 2x^3y^2$
- B) $10x^5y^2 - 4x^4y^3 + 6x^3y^2$
- C) $12x^{12}y^7$
- D) $10x^5y^2 - 4x^4y^3 + 6$

59) Multiply: $(3x - 2)(4x + 1)$

- A) $12x^2 + 5x - 2$
- B) $12x^2 - 5x - 2$
- C) $7x^2 - 5x + 2$
- D) $7x^2 - 11x - 1$

60) Multiply: $(2x - 7)(2x + 7)$

- A) $4x^2 + 49$
- B) $4x^2 - 28x + 49$
- C) $4x^2 + 28x - 49$
- D) $4x^2 - 49$

61) Multiply: $(3x + 2)^2$

- A) $9x^2 + 4$
- B) $9x^2 + 6x + 4$
- C) $9x^2 + 12x + 4$
- D) $3x + 4$

62) Divide: $(5r^3 - 12r^2 - 6r - 9) \div (r - 3)$

- A) $5r^2 + 3r + 3$
- B) $5r^2 - 3r - 3$
- C) $r^2 + 3r + 3$
- D) $5r^2 + 3r + \frac{3}{r-3}$

63) Factor completely:

$$4x^2y^3 - 16x^3y + 8xy^2 + 24xy^4$$

- A) $4(x^2y^3 - 4x^3y + 2xy^2 + 6xy^4)$
- B) $4x(xy^3 - 4x^2y + 2y^2 + 6y^4)$
- C) $4xy(xy^2 - 4x^2 + 2y + 6y^3)$
- D) $4xy(xy^2 - 4x + 2y^2 + 6y^2)$

64) Factor completely: $25x^3y^2 - 15xy^3$

- A) $5xy^2(5x^2 - 3y)$
- B) $5x^2y^2(5x^2 - 3y)$
- C) $5x^3y^3(5y - 3x)$
- D) $(5x^2y - 3y)(5xy + 5y)$

65) Factor completely: $ax - a + bx - b$

- A) $(x + 1)(a + b)$
- B) $(x + 1)(a - b)$
- C) $(x - 1)(a + b)$
- D) $(x - 1)(a - b)$

66) Factor completely: $x^3 - 5x^2 + 3x - 15$

- A) $x(x + 5)(x - 3)$
- B) $(x - 3)(x^2 + 5)$
- C) $(x - 5)(x^2 + 3)$
- D) $x(x - 5)(x + 3)$

67) Which is a factor of $x^2 - 9x + 20$

- A) $(x + 5)$
- B) $(x - 5)$
- C) $(x + 4)$
- D) $(x - 10)$

68) Which is a factor of $4x^2 - 11x + 6$

- A) $(4x - 3)$
- B) $(x + 2)$
- C) $(3x + 2)$
- D) $(2x - 3)$

69) Factor completely: $16x^2 - 25y^2$

- A) $(4x - 5y)(4x - 5y)$
- B) $(16x + 5y)(x - 5y)$
- C) $(4x - 5y)(4x + 5y)$
- D) $(4x + 5y)(4x + 5y)$

70) Simplify: $\frac{a^2 - b^2}{4a - 4b}$

- A) $\frac{a-b}{4}$
- B) $a + b$
- C) $\frac{a+b}{4}$
- D) $a - b$

71) Simplify: $\frac{x^2 - 1}{3x^2 + 2x - 5}$

- A) $\frac{x-1}{3x+5}$
- B) $\frac{x+1}{3x+5}$
- C) $x + 1$
- D) $3x + 5$

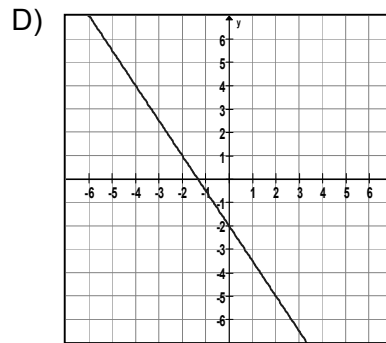
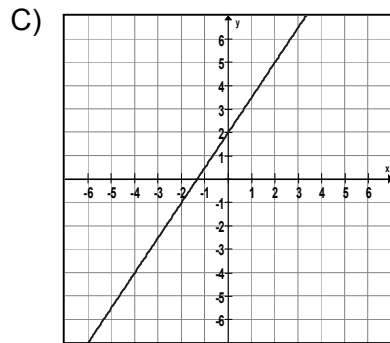
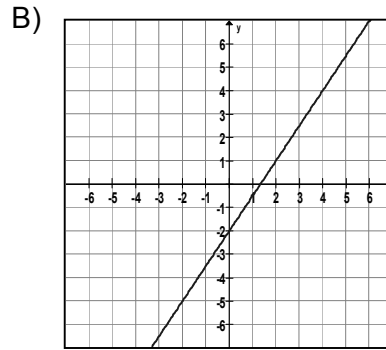
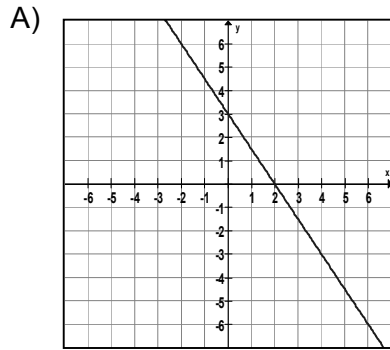
72) Simplify: $\frac{x^2 - 4x + 3}{x - 1}$

- A) $x + 3$
- B) $x - 1$
- C) $x + 1$
- D) $x - 3$

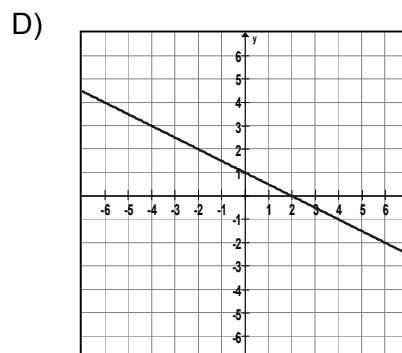
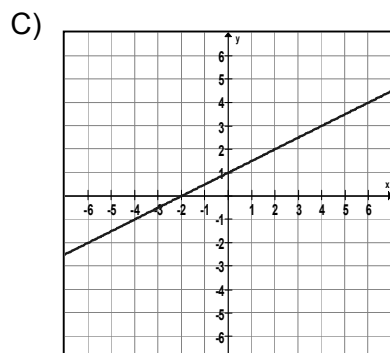
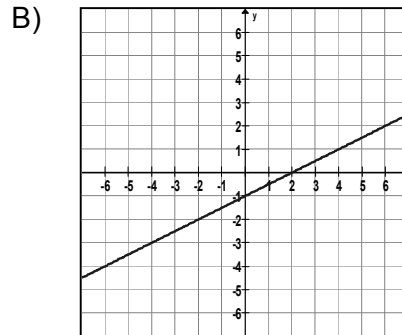
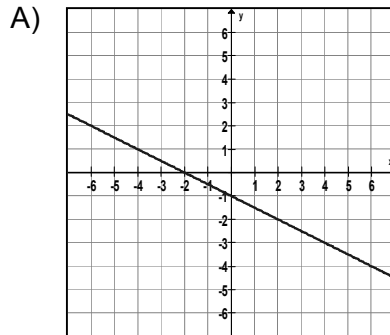
- 73) Solve by factoring: $x^2 - 6x - 7 = 0$
- A) $x = -7, x = 1$
 B) $x = -7, x = -1$
 C) $x = 7, x = 1$
 D) $x = 7, x = -1$
- 74) Solve by factoring: $3y^2 - 4y - 15 = 0$
- A) $y = -\frac{5}{3}, y = 3$
 B) $y = \frac{5}{3}, y = -3$
 C) $y = -3, y = 5$
 D) $y = 1, y = 5$
- 75) Solve by factoring: $2x^2 - 9x = 5$
- A) $x = 5, x = \frac{1}{2}$
 B) $x = 5, x = -1$
 C) $x = 5, x = -\frac{1}{2}$
 D) $x = -5, x = 1$
- 76) Solve by factoring: $3a^2 + 14a + 8 = 0$
- A) $a = -\frac{4}{3}, a = -2$
 B) $a = \frac{2}{3}, a = 4$
 C) $a = -\frac{3}{2}, a = -4$
 D) $a = -\frac{2}{3}, a = -4$
- 77) The sum of a number and its square is 72. Find the number.
- A) $x = -9$
 B) $x = -9$ or $x = 8$
 C) $x = 9$ or $x = -8$
 D) $x = 8$
- 78) If the sides of a square are increased by 4 inches, the area becomes 121 square inches. Find the length of the sides of the original square.
- A) 7 inches
 B) 15 inches
 C) 11 inches
 D) 8 inches

- 79) Simplify (assume the variable represents a non-negative number): $\sqrt{40x^9}$
- A) $4x^4\sqrt{10x}$
 B) $4\sqrt{10x^9}$
 C) $2x^4\sqrt{10x}$
 D) $2x^9\sqrt{10}$
- 80) Simplify (assume the variable represents a non-negative number): $\sqrt{18z^6}$
- A) $9z^3$
 B) $9z^3\sqrt{2}$
 C) $3z^3\sqrt{2z^3}$
 D) $3z^3\sqrt{2}$
- 81) Add: $\sqrt{48} + \sqrt{27}$
- A) $25\sqrt{3}$
 B) $7\sqrt{3}$
 C) $12\sqrt{3}$
 D) $5\sqrt{3}$
- 82) Multiply: $\sqrt{3}(2\sqrt{3} - \sqrt{2})$
- A) $6 - \sqrt{6}$
 B) $\sqrt{18} - \sqrt{6}$
 C) $3 - \sqrt{6}$
 D) $2\sqrt{9} - 6$
- 83) Divide: $\frac{\sqrt{56x^5y^6}}{\sqrt{2y^4}}$
- A) $2x^2y\sqrt{7x}$
 B) $4x^2y\sqrt{7x}$
 C) $2x^4y^2\sqrt{7xy}$
 D) $28xy\sqrt{x}$
- 84) The hypotenuse of a right triangle is 13 feet and one leg is 12 feet. Find the exact length of the other leg.
- A) 1 foot
 B) 25 feet
 C) $\sqrt{313}$
 D) 5 feet
- 85) Solve using the quadratic formula: $3x^2 + 10x - 8 = 0$
- A) $-2, \frac{4}{3}$
 B) $2, -\frac{4}{3}$
 C) $\frac{2}{3}, -4$
 D) $-\frac{2}{3}, 4$

86) Select the correct graph of $3x + 2y = 6$



87) Select the correct graph of $y = \frac{1}{2}x - 1$



88) Find the x-intercept point for $y = -\frac{5}{2}x + 15$.

- A) (0, -15) B) (6, 0)
C) (-6, 0) D) (0, 15)

89) Find the y-intercept point for $x + 3y = 2$.

- A) (0, 2) B) $(0, \frac{3}{2})$
C) $(0, -\frac{2}{3})$ D) $(0, \frac{2}{3})$

90) Find the slope of the line passing through the points (-1, 4) and (-5, -4).

- A) 2 B) -2
C) undefined D) 0

91) Find the slope and y-intercept of the line:
 $6x - 2y = 12$.

- A) $m = 1/3$, y-intercept: (0, -2)
B) $m = -3$, y-intercept: (0, 6)
C) $m = 3$, y-intercept: (0, -6)
D) $m = -1/3$, y-intercept: (0, 2)

MAT 0020 BASIC ALGEBRA II – COMPREHENSIVE REVIEW

Answer Key

- | | | |
|-------|-------|-------|
| 1) D | 31) B | 61) C |
| 2) C | 32) B | 62) A |
| 3) B | 33) C | 63) C |
| 4) C | 34) D | 64) A |
| 5) A | 35) C | 65) C |
| 6) D | 36) C | 66) C |
| 7) A | 37) B | 67) B |
| 8) B | 38) C | 68) A |
| 9) C | 39) A | 69) C |
| 10) C | 40) D | 70) C |
| 11) A | 41) D | 71) B |
| 12) B | 42) B | 72) D |
| 13) C | 43) C | 73) D |
| 14) A | 44) B | 74) A |
| 15) B | 45) B | 75) C |
| 16) C | 46) D | 76) D |
| 17) D | 47) C | 77) B |
| 18) B | 48) A | 78) A |
| 19) A | 49) B | 79) C |
| 20) A | 50) C | 80) D |
| 21) D | 51) D | 81) B |
| 22) C | 52) B | 82) A |
| 23) B | 53) C | 83) A |
| 24) D | 54) B | 84) D |
| 25) A | 55) A | 85) C |
| 26) B | 56) C | 86) A |
| 27) C | 57) A | 87) B |
| 28) D | 58) B | 88) B |
| 29) A | 59) B | 89) D |
| 30) C | 60) D | 90) A |
| | | 91) C |