

Part II: choose the correct answer.

1- Which of the following is a rational number ?

- a) $\sqrt{3}$ b) $1.\overline{42}$ c) 0.15673298 d) π

2- Express the number $0.\overline{36}$ as a rational number.

- a) $\frac{35}{99}$ b) $\frac{9}{25}$ c) $\frac{4}{11}$ d) $\frac{5}{11}$

3- Express the number $1.\overline{27}$ as a rational number.

- a) $\frac{127}{99}$ b) $\frac{127}{100}$ c) $\frac{14}{11}$ d) $\frac{21}{15}$

4- Express the number $0.\overline{18}$ as a rational number.

- a) $\frac{17}{99}$ b) $\frac{9}{50}$ c) $\frac{3}{11}$ d) $\frac{2}{11}$

5- Which of the following is true?

a) $1.\overline{3}$ is an integer.

b) $x^3 - 2x^{\frac{1}{2}} + 1$ is a polynomial of degree 3.

c) $\frac{5}{6} - \frac{3}{4} = \frac{1}{12}$

d) $\frac{1 - \frac{2}{y}}{\frac{3}{y} - 1} = \frac{y^2 - 2}{3 - y^2}$

6- Compute $\sqrt{18} + \sqrt{32}$

a) $7\sqrt{2}$

b) 14

c) $\sqrt{2}$

d) $12\sqrt{2}$

7- Simplify $\sqrt{12} + \sqrt{75}$.

a) $7\sqrt{3}$

b) $5\sqrt{2}$

c) $6\sqrt{2}$

d) $9\sqrt{3}$

8- Compute $\sqrt{18} + 5\sqrt{8} - \sqrt{50}$.

a) $8\sqrt{2}$

b) $-2\sqrt{6}$

c) $-7\sqrt{2}$

d) $12\sqrt{2}$

9- $\sqrt[3]{8\sqrt{x}} =$

a) $2\sqrt[6]{x}$

b) $2\sqrt{x}$

c) $2|x|$

d) $\sqrt[6]{8x}$

10- Simplify $\sqrt{4x^4 + 16x^2}$

a) $4|x|\sqrt{x^2 + 4}$

b) $4x\sqrt{x^2 + 4}$

c) $2x^2 + 4x$

d) $2|x|\sqrt{x^2 + 4}$

11- Simplify $\sqrt[4]{16x^8y^5}$.

a) $4x^2|y|\sqrt[4]{y}$

b) $2x^2y$

c) $4x^4y^2$

d) $2x^2y\sqrt[4]{y}$

12- Rationalize the numerator of $\frac{\sqrt{3+x}-2}{x-1}$

a) $\frac{2}{x-1}$

b) $\frac{\sqrt{3+x}+2}{x^2+1}$

c) $\frac{1}{\sqrt{3+x}+2}$

d) $\frac{\sqrt{3+x}+2}{x+1}$

13- Rationalize the numerator of $\frac{\sqrt{3}+\sqrt{5}}{2}$.

a) $\frac{2}{\sqrt{3}+\sqrt{5}}$

b) $\sqrt{3} + \sqrt{5}$

c) $\frac{-1}{\sqrt{3}-\sqrt{5}}$

d) $\frac{1}{\sqrt{3}-\sqrt{5}}$

14- Rationalize the denominator of $\frac{6}{\sqrt{5}-\sqrt{2}}$.

a) $2\sqrt{5} - \sqrt{2}$

b) $2\sqrt{5} + 2\sqrt{2}$

c) $2\sqrt{5} + \sqrt{2}$

d) $2\sqrt{5} - 2\sqrt{2}$

15- Simplify the expression $(\sqrt{y} + \sqrt{2})(\sqrt{y} - \sqrt{2}) - (y + 4)$.

a) -6

b) $2\sqrt{y} - 8$

c) $2y$

d) 0

16- Compute $(-32)^{\frac{2}{5}}$

a) -4

b) 4

c) $-\frac{1}{4}$

d) $\frac{1}{4}$

17- Simplify $\left(\frac{2y}{5x^{-1}}\right)^2 \left(\frac{2x}{y}\right)^{-1}$

a) $\frac{4y}{25x}$

b) $\frac{2xy^3}{25}$

c) $\frac{2y^3}{5x^2}$

d) $\frac{2x^2}{15x}$

18- Simplify $y^{\frac{-2}{3}} \left(y^{\frac{5}{3}} - y^{\frac{2}{3}} \right)$.

a) $y^{\frac{2}{3}} - 1$

b) $y - 1$

c) $y^{\frac{2}{3}}$

d) y^2

19- Simplify $\left(\frac{x^2 y^{-4}}{3 x^{-3} y} \right)^{-2}$.

a) $\frac{y^{10}}{9x^{10}}$

b) $\frac{9x^{10}}{y^{10}}$

c) $\frac{9y^{10}}{x^{10}}$

d) $\frac{9y^{10}}{x^5}$

20- Simplify $\frac{(2 a^{-2} b)^4 (ab)^{-3}}{a^{-4}}$

a) $\frac{8}{a^7 b}$

b) $\frac{16 b}{a^7}$

c) $\frac{a}{8b^7}$

d) $\frac{a^7 b}{16}$

21- Simplify $\left(\frac{x^3}{y^{-1}} \right)^2 \left(\frac{y^3}{x^{-2}} \right)^{-1}$.

a) $x y^5$

b) $\frac{y}{x^4}$

c) $\frac{x^4}{y}$

d) $\frac{y^5}{x}$

22- Find the exact value of $|2 - |-12||$.

- a) 10 b) -10 c) 14 d) 24

23- Simplify the expression $\sqrt{5} - |\sqrt{5} - 7|$.

- (a) 7 (b) $2\sqrt{5}$ (c) $2\sqrt{5} + 7$ (d) $2\sqrt{5} - 7$

24- Simplify $\frac{\frac{2}{5} - \frac{1}{20}}{\frac{3}{10} + \frac{9}{40}}$.

- a) $-\frac{3}{2}$ b) $-\frac{2}{3}$ c) $\frac{3}{2}$ d) $\frac{2}{3}$

25- Simplify $\frac{\frac{1}{a+1} - \frac{1}{a}}{1 - \frac{1}{a}}$

- a) $\frac{1}{a^2 - 1}$ b) $\frac{1}{a - 1}$ c) $\frac{1}{a+1}$ d) $\frac{-1}{a^2 - 1}$

26- Simplify $\frac{x}{x-1} - \frac{3}{x}$.

a) $\frac{x^2-3x+3}{x^2-x}$

b) $\frac{x-2}{x-1}$

c) $\frac{3}{x-1}$

d) $\frac{x-3}{x^2-x}$

27- Simplify $\frac{1}{x-3} - \frac{6}{x^2-9}$

a) $\frac{1}{x-3}$

b) $\frac{1}{x+3}$

c) $\frac{-1}{x+3}$

d) $\frac{-1}{x-3}$

28- Simplify $\frac{x^2-25}{2x+6} \div \frac{x^2-3x-10}{x^2+5x+6}$

$\frac{x-5}{2}$

b) $\frac{x+5}{2(x-1)}$

c) $\frac{x+5}{2}$

d) $\frac{x-5}{3(x+6)}$

29- Simplify $\frac{x^2-2x-3}{2x^2+6x} \div \frac{x-3}{x+3}$.

a) $\frac{2x}{x+1}$

b) $\frac{x+1}{2x}$

c) $\frac{x-1}{2x}$

d) $\frac{2x}{x-1}$

30- Simplify the expression $(x+2)^3 - x^3 - 8$

a) $6x^2 + 12x$

b) 0

c) $3x^2 + 2x$

d) $6x^2 + 4x$

31- Factor the expression $x^3 - 3x^2 + 4x - 12$.

a) $(x^2 + 4)(3x - 1)$

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

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

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

32- Factor the expression $(a+1)^2 - 4(a+1) - 12$

a) $(a - 2)(a + 6)$

b) $(a - 3)(a - 12)$

c) $(a - 6)(a + 4)$

d) $(a - 5)(a + 3)$

33- Factor the expression $x^3 - 3x^2 - 9x + 27$.

a) $(x - 3)^2(x + 3)$

b) $(x + 3)^2(x - 3)$

c) $(x - 3)(x + 3)(x - 9)$

d) $(x^2 + 3)(x - 3)$

34- Simplify $(3 - 2i)(1 + i)$, where $i = \sqrt{-1}$

a) $1 + i$

b) $5 + i$

c) $3 - i$

d) $1 + 5i$

35- Simplify $(-6 + 6i) + 3i(1 - 2i)$ where $i = \sqrt{-1}$

a) $-3 + 3i$

b) $12 + 9i$

c) 0

d) $9i$

36- Simplify $(2 + 3i)(5 + 2i)$, where $i = \sqrt{-1}$.

a) $-6 + 19i$

b) $5 + i$

c) $4 + 19i$

d) $4 - 5i$

37- Simplify $\frac{-2+4i}{3i}$, where $i = \sqrt{-1}$.

- a) $\frac{-2}{3} + \frac{4}{3}i$ b) $\frac{4}{3} + \frac{2}{3}i$ c) $\frac{2}{3} - \frac{4}{3}i$ d) $\frac{4}{3} - \frac{2}{3}i$

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

- a) $\frac{x-2}{x^2+x+1}$ b) $\frac{x+2}{x^2-x+1}$ c) $\frac{x+2}{x^2+x+1}$ d) $\frac{x-2}{x^2-x+1}$

39- Simplify $\frac{5}{(2x-3)} + \frac{3}{(2x-3)^2}$.

- a) $\frac{10x-12}{(2x-3)^2}$ b) $\frac{10x}{(2x-3)^2}$ c) $\frac{2x-12}{(2x-3)^2}$ d) $\frac{2x-10}{(2x-3)^2}$

40- Simplify $\frac{t-3}{t^2+9} \cdot \frac{t+3}{t^2-9}$.

a) $\frac{1}{t^2+9}$

b) $\frac{t}{t-9}$

c) $\frac{t^2}{t^2+3}$

d) $\frac{-1}{t+3}$

41- Solve the equation $x^2 - 4x + 1 = 0$

a) $x = 4 \pm \sqrt{6}$

b) $x = -2 \pm 2\sqrt{3}$

c) $x = -2, x = 1$

d) $x = 2 \pm \sqrt{3}$

42- Solve the equation $x^2 - 6x + 2 = 0$

a) $x = 3 \pm \sqrt{7}$

b) $x = -3 \pm \sqrt{7}$

c) $x = -2, x = 3$

d) $x = 3 \pm 2\sqrt{7}$

43- Solve the equation $\frac{2x-1}{x+2} = \frac{4}{5}$.

a) $\frac{-5}{11}$

b) $\frac{13}{6}$

c) $\frac{-4}{5}$

d) $\frac{1}{2}$

44- Find the solution of the equation $\frac{x^2}{2x+6} = \frac{1}{x+3}$.

a) ± 1

b) ± 2

c) $\pm \sqrt{2}$

d) $-3, \pm 1$

45- Find the solution of the equation $\frac{x+1}{2} - \frac{5}{3} = 2 - x$

a) $\frac{9}{19}$

b) $\frac{19}{9}$

c) $\frac{22}{3}$

d) $\frac{9}{4}$

46- Find the distance between $\frac{-5}{2}$ and $\frac{1}{3}$.

a) $\frac{17}{6}$

b) $\frac{13}{6}$

c) $\frac{11}{6}$

d) $\frac{5}{6}$

47- Find the distance between π and 5.

- a) 2π b) 15 c) $5 - \pi$ d) $\pi - 5$

48- Find the solution set of the equation $x^{\frac{4}{3}} - 4x^{\frac{1}{3}} = 0$

- a) $\{-2, 0\}$ b) $\{-4, 0\}$ c) $\{0, 4\}$ d) $\{0, 2\}$

49- Find the solution set of the equation $x + \sqrt{x+1} = 1$.

- a) $\{0\}$ b) $\{0, 3\}$ c) $\{3\}$ d) $\{-1, 1\}$

50- Find the solution set of the equation $|x - 5| = 3$.

- a) $\{0, 8\}$ b) $\{2, 8\}$ c) $\{-1, 2\}$ d) $\{-2, 1\}$

51- Find the solution set of the equation $\sqrt{2x + 3} - 5 = 0$

- a) {11} b) {-4} c) {4} d) {-11}

52- Solve the linear inequality $-2 \leq \frac{5x+1}{5} \leq \frac{1}{2}$.

- a) $[-\frac{21}{10}, \frac{2}{5})$ b) $[-\frac{11}{5}, 0)$ c) $[-\frac{11}{5}, \frac{3}{10})$ d) $[-\frac{11}{5}, \frac{1}{5})$

53- Solve the linear inequality $-1 \leq 5 - 3x \leq 2$.

- a) (1, 2] b) $(\frac{4}{3}, \frac{7}{3}]$ c) $[-\frac{7}{3}, -\frac{4}{3})$ d) [1, 2)

54- Solve the linear inequality $\frac{1-2x}{x+2} \leq 0$.

a) $[-2, \frac{1}{2})$

b) $(-\infty, \frac{-1}{2}] \cup (2, \infty)$

c) $(\frac{1}{2}, -2)$

d) $(-\infty, -2) \cup [\frac{1}{2}, \infty)$

55- Find the values of x for which $|2x - 3| = 7$

a) $-5, 2$

b) $-2, 5$

c) $\frac{-5}{2}, 5$

d) $2, \frac{5}{2}$

56- Find the values of x for which $|3x + 1| = 5$

a) $-2, 4$

b) $-4, 2$

c) $\frac{-4}{3}, 2$

d) $-2, \frac{4}{3}$

57- Find the midpoint of the line segment between A(3, -4) and B(-1, 7).

- a) $(2, \frac{-11}{2})$ b) $(1, \frac{3}{2})$ c) $(-2, \frac{11}{2})$ d) $(-1, \frac{-3}{2})$

58- Find the x- and y-intercepts of the graph of the equation $y^2 - 2xy + 4x = 1$.

- a) x-intercepts $\frac{1}{4}$ and y-intercepts ± 1 b) x-intercepts $\frac{1}{2}$ and y-intercepts 1, 2
c) x-intercepts 3 and y-intercepts 1 d) x-intercepts $\frac{-1}{4}$ and y-intercepts ± 1

59- Find the x -intercept of the graph of the equation

$$y = \sqrt{x + 4} .$$

- a) -4 b) 2 c) ± 2 d) no x-intercepts

60- Find the y -intercept, if any of the graph of the equation $y = \sqrt{x^2 - 9}$

- a) $y = 9$ b) $y = \pm 3$ c) $y = 3$ d) no y-intercepts

61- Find an equation of the circle that has center $(-2, 1)$, and passes through the point $(4, 3)$.

a) $(x + 2)^2 + (y - 1)^2 = 2\sqrt{10}$

b) $(x + 2)^2 + (y - 1)^2 = 40$

C) $(x - 2)^2 + (y - 1)^2 = 40$

d) $(x - 4)^2 + (y - 3)^2 = 2\sqrt{10}$

62- Which of the following equations is symmetric with respect to the x-axis.

a) $y = x^2 + x^6$

b) $x^2y^2 + xy = 3$

C) $y = x^3 + 5x$

d) $x = y^2 - y^4$

63- Which of the following equations is NOT symmetric with respect to the x-axis?

a) $x = y$ b) $x = \frac{1}{y^2}$ c) $x = |y|$ d) $x = y^6 - y^2$

64- Which of the following equations has a graph symmetric about the y – axis ?

a) $y = x^3$ b) $y = x^2 - 3$ c) $y^2 + 2 = x$ d) $y = \sqrt{x}$

65- The graph represented by $y = x^2 + 2$ is:

- a) symmetric about the x-axis.
- b) symmetric about the y-axis.
- c) symmetric about the origin .
- d) none of the above is true.

66- Find an equation of the line through the point(1, -5) and has a slope $\frac{3}{2}$.

a) $3x - 2y - 13 = 0$

b) $3x - 2y - 8 = 0$

c) $3x - 2y - 17 = 0$

d) $2x - 3y - 17 = 0$

67- Find an equation of the line passes through the point(1,2) and perpendicular to the line $y=3$.

a) $y = 1$

b) $x = 1$

c) $x = 2$

d) $y = 2$

68- Find an equation of the line passes through the point $(-1, 3)$ and perpendicular to the line

$$2x + y + 1 = 0$$

a) $2x - y + 3 = 0$

b) $x + 2y - 5 = 0$

c) $x - 2y + 7 = 0$

d) $2x + y - 1 = 0$

69- If a graph is symmetric with respect to the x - axis and if $(-8, -6)$ is on the graph, then which of the following points is also on the same graph?

a) $(-6, -8)$ b) $(8, 6)$ c) $(8, -6)$ d) $(-8, 6)$

70- The equation of a vertical line passes through $(2, -3)$ is

a) $x = -3$ b) $y = 2$ c) $x = 2$ d) $y = -3$

71- Find the equation of the line that has slope 0.

- a) $x = 1$ b) $y = 2$ c) $x = y$ d) $x + y = 0$

72- Which of the following lines are parallel?

- a) $x + 3y + 1 = 0$ and $3x - y + 1 = 0$
b) $2x + y + 2 = 0$ and $6x + 3y - 5 = 0$
c) $x - 3y + 3 = 0$ and $3x - y + 4 = 0$
d) $x = 2$ and $y = 2$