

Intermediate Algebra
Chapters 6 & 7 Practice Test, Calculator Allowed

I. Sketch the graph of the following. Show any vertical asymptotes as dashed lines. Also, identify the domain.

1. $f(x) = \frac{3.2}{x^2-1}$

2. $f(x) = \frac{-1}{x-1}$

3. $f(x) = \frac{-3}{(x-4)^2}$

II. Evaluate $f(x)$ at the given value of x .

4. $f(x) = \frac{3.2}{x^2-1}$ for $x = -1.4$

5. $f(x) = \frac{3x^2+2x}{7x}$ for $x = -3$

6. $f(x) = \frac{6x^2-4x+5}{9-x}$ for $x = 9$

III. Simplify the following problems by performing the indicated operations. Write all fractions in lowest terms.

7. $\frac{x^2+3x+2}{2x^2-x-10}$

8. $\frac{x^2+4}{x^2-4} \cdot \frac{x+2}{x-2}$

9. $\frac{1}{8x^2} \div \frac{1}{2x^3}$

10. $\frac{2x-6}{6x^2-15x} \div \frac{4x-12}{18x^2-45x}$

IV. Solve.

11. $\frac{x+1}{5} = \frac{x}{3}$

12. $\frac{3}{7} = \frac{4}{x-1}$

V. Solve the problem.

13. In the following formula, y is the minimum number of hours of studying required to attain a test score of x : $y = \frac{0.32x}{100.5-x}$. How many hours of studying are needed to score 86? Round to the nearest hundredth of an hour.

14. The area A of a rectangle is $5x^2 + 13x - 6$ and its width W is $x + 3$. Find the length L of the rectangle.

15. If 3.2 ounces of oil are to be added to 16 gallons of gasoline, then x ounces of oil should be added to 37 gallons of gasoline.

a) Write the proportion.

b) Solve for x .

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IV. Simplify the following problems by performing the indicated operations. Write all radical answers in simplified form, NOT as decimals.

16. $(2x^{-3}y^{1/3})^3$

17. $(\frac{1}{2}x^2y^{-3})^3$

18. $\sqrt{3x^3} \cdot \sqrt{27x^3}$

19. $\sqrt{18} \cdot \sqrt{2}$

20. $4\sqrt[3]{16} - 5\sqrt[3]{2}$

21. $\sqrt{5} + 3\sqrt{2} - 7\sqrt{5}$

22. $\frac{\sqrt{45x^3y^3}}{\sqrt{5y}}$

23. $\frac{\sqrt{98x^2y^3}}{\sqrt{xy}}$

24. $\frac{\sqrt[3]{27y^7}}{\sqrt[3]{x^6y^2}}$

25. $\frac{\sqrt[3]{32x^4}}{\sqrt[3]{-4y^3}}$

V. Simplify the following complex expressions by performing the indicated operations. Write all answers in standard form.

26. $(7 - 4i)(-2 - i)$

27. $(2 + 3i)(3 - 5i)$

28. $(7 - i\sqrt{5})^2$

29. $(6 + i)(6 - i)$

30. $\frac{3+4i}{2i}$

31. $\frac{2+3i}{4-2i}$

VI. Find the domain of f, write your answer in interval notation.

32. $f(x) = \sqrt{4 - 6x}$

33. $f(x) = \sqrt{2x^2 + 3}$

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Answers:

I. Use a calculator to sketch your graphs!

1. Vertical Asymptote: $x = \pm 1$, Domain: All reals excluding $x = \pm 1$

2. Vertical Asymptote: $x = 1$, Domain: All reals excluding $x = 1$

3. Vertical Asymptote: $x = 4$, Domain: All reals excluding $x = 4$

4. $f(-1.4) = \frac{10}{3}$

5. $f(-3) = -1$

6. *undefined*

7. $\frac{x+1}{2x-5}$

8. $\frac{x^2+4}{(x-2)^2}$

9. $\frac{x}{4}$

10. $\frac{3}{2}$

11. $x = \frac{3}{2}$

12. $x = \frac{31}{3}$

13. 1.9 hours

14. $5x - 2$

15. a) $\frac{3.2}{16} = \frac{x}{37}$ b) 7.4 ounces

16. $\frac{8y}{x^9}$

17. $\frac{x^6}{8y^9}$

18. $9x^3$

19. 6

20. $3\sqrt[3]{2}$

21. $3\sqrt{2} - 6\sqrt{5}$

22. $3xy\sqrt{x}$

23. $7y\sqrt{2x}$

24. $\frac{3y^3\sqrt{y^2}}{x^2}$

25. $\frac{-2x^3\sqrt{x}}{y}$

26. $-18 + i$

27. $21 - i$

28. $44 - 14i\sqrt{5}$

29. 37

30. $\frac{-4+3i}{-2}$

31. $\frac{1+8i}{10}$

32. $(-\infty, \frac{2}{3}]$

33. $(-\infty, \infty)$