

Florida State
College at
Jacksonville

Assessment
and
Certification
Centers

PERT

Postsecondary
Education
Readiness
Test

Study Guide for
Mathematics

Note: Pages 1 through 7 are a basic review. Pages 8 forward are more relevant to the content of the PERT mathematics assessment.

MULTIPLE CHOICE Choose the one alternative that best completes the statement or answers the question. Evaluate.

1. $29 + 16 \cdot 13$
 A. 455 B. 585
 C. 58 D. 237

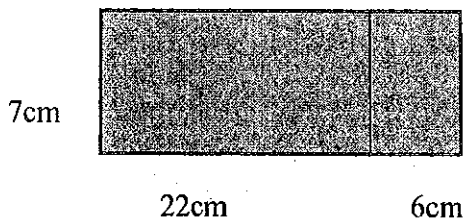
2. $96 - 5 \cdot 2 \cdot 3$
 A. 546 B. 86
 C. 546 D. 66

3. $\frac{9-2}{4+3}$
 A. 7 B. 3
 C. 9 D. 1

4. $(7 + 1)(7 - 1)$
 A. 47 B. 48
 C. 49 D. 14

Find the area of the shaded area.

5.



- A. 196 square centimeters
- B. 924 square centimeters
- C. 35 square centimeters
- D. 174 square centimeters

Find the average.

6. 11, 16, 15, 22
 A. 64 B. 15
 C. 17 D. 16

Solve.

7. For five mathematics tests your scores were 81, 86, 81, 76, 71. What was your average score?
 A. 383 B. 78
 C. 79 D. 75

Choose a strategy and solve.

8. Your car gets about 30 miles per gallon. You are planning to drive to see your friends who live about 930 miles away. How many gallons of gas will you need to purchase to make the trip to see your friends and to return home? State your answer to the nearest gallon?
 A. about 30 gallons
 B. about 45 gallons
 C. about 62 gallons
 D. about 51 gallons

9. In 1998 your house cost \$82,400. In 2000 your house was valued at \$102,650. How much did the value of your home increase?
 A. \$19,250
 B. \$20,250
 C. No increase, it was a decrease
 D. \$21,250

10. While shopping you note the average price for a CD is \$8 including tax. You have \$112 in your pocket. About how many CDs can you buy?
 A. 21 B. 14
 C. 17 D. 19

11. In 2000 you weighed 175 pounds. In 2001 you weighed 162 pounds, and in 2002 you weighed 154 pounds. How many pounds did you lose from 2000 to 2002?

- A. 21 pounds
- B. No weight loss, you gained weight
- C. 13 pounds
- D. 8 pounds

Solve.

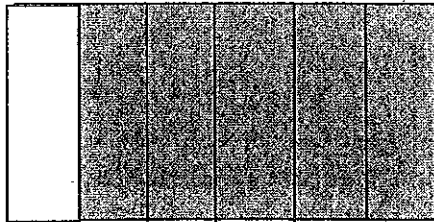
12. Write this expression in words.

$$8 + 16 = 24$$

- A. The sum of 8 and 16 is 24
- B. The difference between 8 and 16 is 24
- C. The product of 8 and 16 is 24
- D. The quotient of 8 and 16 is 24

Identify a fraction or mixed number that represents the shaded part of the figure.

13.



- A. 5
- B. $\frac{1}{5}$
- C. $\frac{1}{6}$
- D. $\frac{5}{6}$

Write the number as an improper fraction.

14. $10\frac{3}{4}$

- A. $\frac{40}{4}$
- B. $\frac{43}{4}$
- C. $\frac{34}{3}$
- D. $\frac{40}{3}$

Write the improper fraction as a mixed number.

15. $\frac{17}{5}$

- A. $3\frac{2}{5}$
- B. $3\frac{2}{3}$
- C. $2\frac{3}{5}$
- D. $5\frac{2}{5}$

Solve for n.

16. $\frac{5}{16} = \frac{n}{80}$

- A. 80
- B. 25
- C. 5
- D. 400

17. $3 = \frac{n}{5}$

- A. 15
- B. $\frac{5}{3}$
- C. $\frac{1}{15}$
- D. $\frac{3}{5}$

Simplify the fraction.

18. $\frac{12}{20}$

- A. $\frac{4}{5}$
- B. $\frac{3}{4}$
- C. $\frac{12}{20}$
- D. $\frac{3}{5}$

19. $\frac{15}{4}$

- A. $1\frac{3}{4}$
- B. $3\frac{1}{2}$
- C. $3\frac{3}{4}$
- D. $4\frac{1}{4}$

Between the pair of numbers, place the correct sign: <, =, or >.

20. $\frac{1}{2}$ vs $\frac{3}{8}$

- A. <
- B. >
- C. =

21. $\frac{4}{16}$ vs $\frac{4}{13}$

- A. <
- B. >
- C. =

Solve the problem below. Write your answer in simplest form.

22. Of a family's \$750 weekly income, \$35 usually goes toward groceries. What fraction of the family's weekly income is usually spent on groceries?

- A. $\frac{35}{750}$ B. $\frac{7}{150}$
 C. $\frac{150}{7}$ D. $\frac{750}{35}$

23. You need a piece of fabric $\frac{5}{12}$ yard long. Which of these is the smallest piece of fabric that would work?

- A. $\frac{1}{2}$ yard B. $\frac{5}{16}$ yard
 C. $\frac{2}{3}$ yard

Add and simplify.

24. $\frac{1}{4} + \frac{2}{4}$

- A. $\frac{3}{8}$ B. $\frac{3}{4}$
 C. $\frac{1}{2}$ D. $\frac{3}{16}$

25. $\frac{5}{27} + \frac{4}{27} + \frac{12}{27}$

- A. $\frac{20}{27}$ B. $\frac{7}{9}$
 C. $\frac{21}{27}$ D. $\frac{21}{81}$

26. $\frac{1}{3} + \frac{1}{2}$

- A. $\frac{1}{6}$ B. $\frac{2}{3}$
 C. $\frac{5}{6}$ D. $\frac{3}{4}$

27. $\frac{2}{3} + \frac{1}{12}$

- A. $\frac{3}{4}$ B. $\frac{9}{12}$ C. $\frac{1}{4}$ D. $\frac{7}{12}$

28. $2\frac{1}{2} + 1\frac{5}{8}$

- A. $3\frac{6}{8}$ B. $4\frac{1}{2}$ C. $3\frac{1}{8}$ D. $4\frac{1}{8}$

29. $5\frac{1}{3} + 17\frac{1}{5}$

- A. $22\frac{2}{15}$ B. $23\frac{2}{15}$
 C. $22\frac{8}{15}$ D. $23\frac{8}{15}$

30. $2\frac{7}{8} + 3\frac{1}{5} + \frac{1}{2}$

- A. $7\frac{23}{40}$ B. $5\frac{23}{40}$
 C. $6\frac{1}{2}$ D. $6\frac{23}{40}$

Subtract and simplify.

31. $\frac{5}{6} - \frac{1}{6}$

- A. $\frac{2}{3}$ B. $\frac{1}{3}$
 C. $\frac{4}{12}$ D. $\frac{1}{2}$

32. $\frac{26}{11} - \frac{51}{11}$

- A. $-2\frac{3}{11}$ B. $1\frac{2}{11}$
 C. $3\frac{1}{11}$ D. $2\frac{10}{11}$

33. $\frac{8}{9} - \frac{1}{2}$

- A. $1\frac{7}{18}$ B. $\frac{7}{18}$
 C. $\frac{1}{3}$ D. 1

34. $\frac{11}{15} - \frac{1}{3}$

- A. $\frac{2}{9}$ B. $\frac{2}{3}$ C. $\frac{5}{6}$ D. $\frac{2}{5}$

Florida State College Review for PERT Mathematics - Part 1

35. $11 - 2\frac{1}{5}$
 A. $8\frac{4}{5}$ B. $9\frac{1}{5}$ C. $9\frac{4}{5}$ D. $10\frac{4}{5}$

36. $12\frac{2}{3} - \frac{3}{5}$
 A. $12\frac{1}{2}$ B. $12\frac{1}{15}$ C. $11\frac{1}{15}$ D. $12\frac{1}{3}$

37. $16\frac{3}{8} - 9\frac{5}{8}$
 A. $6\frac{3}{4}$ B. $6\frac{1}{4}$ C. $25\frac{3}{4}$ D. $24\frac{3}{4}$

38. $16\frac{3}{5} - \frac{5}{7}$
 A. $15\frac{31}{35}$ B. $16\frac{31}{35}$ C. 16 D. $16\frac{1}{6}$

Solve the problem below and write your answer in simplest form.

39. A carpenter had a board $27\frac{1}{4}$ " long. He cut off $2\frac{5}{8}$ ". How long was the remaining board?

- A. $24\frac{5}{8}$ " B. $26\frac{5}{8}$ "
 C. $25\frac{5}{8}$ " D. $25\frac{3}{4}$

40. Brian was training to run a marathon. During the three-day period before the race he decided that he would train for a total of 11 hours. If he trained for $2\frac{3}{5}$ hours on the first day and $2\frac{2}{10}$ hours on the second day, how many hours would he need to train on the third day?

- A. $5\frac{4}{5}$ B. $5\frac{1}{2}$ C. $5\frac{3}{5}$ D. $6\frac{1}{5}$

Multiply and reduce to lowest terms.

41. $\frac{5}{12} \circ \frac{1}{5}$
 A. $\frac{1}{10}$ B. $\frac{6}{17}$ C. $\frac{5}{60}$ D. $\frac{1}{12}$

42. $7 \circ \frac{2}{3}$
 A. $\frac{3}{14}$ B. $3\frac{2}{3}$ C. $10\frac{1}{2}$ D. $4\frac{2}{3}$

43. $3\frac{5}{8} \circ \frac{4}{5}$
 A. $1\frac{1}{2}$ B. $2\frac{9}{10}$ C. $1\frac{2}{3}$ D. $2\frac{3}{10}$

44. $5\frac{1}{2} \circ 6$
 A. $30\frac{1}{2}$ B. 33 C. 15 D. 30

Divide and reduce answers to lowest terms.

45. $\frac{2}{3} \div \frac{3}{5}$
 A. $\frac{2}{5}$ B. $\frac{2}{3}$ C. $1\frac{1}{9}$ D. $1\frac{2}{3}$

46. $\frac{1}{2} \div 8$
 A. $\frac{1}{16}$ B. 4
 C. $\frac{1}{10}$ D. None of these

47. $23 \div 4\frac{3}{5}$
 A. $\frac{1}{5}$ B. 5
 C. 10 D. 4

Solve the problem.

48. Mary needs to save \$540 for a computer. It was used and the sales man told her he would sell it to her for $\frac{1}{5}$ off the marked price. What is the price of the computer be after the mark down?

- A. \$180 B. \$360
 C. None of these D. \$510

49. A bag of chips is 24 ounces. A serving size is $\frac{3}{4}$ ounce. How many servings are in the bag of chips?

- A. 18 servings B. $9\frac{1}{3}$
 C. 32 servings D. $6\frac{3}{4}$

Write the decimal as a fraction or mixed number in lowest terms.

50. 1.02

- A. $1\frac{1}{50}$ B. $1\frac{1}{5}$
 C. $1\frac{1}{25}$ D. $\frac{3}{25}$

51. 1.26

- A. $1\frac{13}{50}$ B. $\frac{13}{50}$
 C. $\frac{13}{25}$ D. $\frac{13}{100}$

Write the number in decimal notation.

52. five and 3 hundredths

- A. 5.003 B. 5.03
 C. 5.3 D. .53

Write the decimal number in words.

53. 162.35

- A. one hundred sixty-two and thirty-five tenths
 B. one hundred sixty and two hundred thirty-five thousandths
 C. one hundred sixty-two and thirty-five hundredths
 D. one hundred sixty-two and thirty-five thousandths

Write the number in decimal notation.

54. A strand of hair is twenty two thousandths of an inch thick.

- A. 0.22 inches B. 0.022 inches
 C. 0.0022 inches D. 0.00022 inches

Identify the place value of the 8 in the decimal number below.

55. 24.638

- A. Tenths B. Hundredths
 C. Thousandths D. Ten-thousandths

Choose the answer with the correct sign between the pair of numbers.

56. 0.025 0.25

- A. $0.025 < 0.25$ B. $0.025 > 0.25$
 C. $0.025 = 0.25$

57. 62.233 62.23

- A. $62.233 < 62.23$ B. $62.233 > 62.23$
 C. $62.233 = 62.23$

Put the numbers below in order from the smallest to the largest.

58. 1.32, 1.032, 1.302

- A. 1.32, 1.032, 1.302
 B. 1.032, 1.302, 1.32
 C. 1.302, 1.32, 1.032
 D. 1.32, 1.302, 1.032

Round the numbers below as indicated.

59. Round 9.459 to the nearest whole number.

- A. 10 B. 9 C. 9.46 D. 9.5

60. Round 6.449 to the nearest tenth.

- A. 6.45 B. 6 C. 6.5 D. 6.4

Round to the indicated place.

61. The stock market fell by 2.345% last month. Round this to the nearest tenth of a percent.

- A. 2.3% B. 2.34%
 C. 2% D. 2.35%

62. The median income last year in this state was \$25,347.22. Round this to the nearest thousand dollars.

- A. \$25, 347 B. \$25, 350.00
 C. \$25,000 D. \$26,000

Florida State College Review for PERT Mathematics -- Part 1

Write the ratio as a fraction in simplest form.

63. 12 to 16

- A. $\frac{6}{8}$ B. $\frac{8}{6}$ C. $\frac{3}{4}$ D. $\frac{4}{3}$

In each of the problems below change the percent to an equivalent fraction or mixed number.

64. 25%

- A. 4 B. $\frac{1}{4}$ C. $\frac{3}{4}$ D. $\frac{4}{100}$

65. 125%

- A. $1\frac{1}{4}$ B. $12\frac{1}{4}$ C. $\frac{1}{8}$ D. $\frac{125}{1000}$

66. $\frac{1}{10}\%$

- A. $\frac{1}{10}$ B. $\frac{1}{100}$
 C. $\frac{1}{1000}$ D. $\frac{1}{10000}$

Solve each percent problem below.

67. Find 40% of 700.

- A. 2.8 B. 28
 C. 280 D. 2800

68. Find .25% of 200.

- A. .5 B. 5
 C. 50 D. 500

69. Find 150% of \$2500.

- A. \$375 B. \$3750
 C. \$37500 D. \$375000

70. Find $3\frac{1}{2}\%$ of \$36,000.

- A. \$126 B. \$126000
 C. \$1260 D. \$12600

Find the percent of increase or decrease in the problem below.

71. A surfer purchased a new surf board for \$264. The board was originally \$330.

What was the percent of change?

- A. 55% B. 20%
 C. 25% D. 30%

72. A crafter wants to make 20% profit on the items he makes. If the cost of materials is \$1.20, what should the items sell for to make a 20% profit?

- A. \$1.44 B. \$1.00
 C. \$1.24 D. \$2.40

Find the mean of the set of numbers.

73. Your test scores are 78, 89, 76, 50, 82, and 69. Round your answer to the nearest whole number if necessary.

- A. 74 B. 76
 C. 69 D. 72

Use the tables to solve the following problems.

74.

Dog	Weight (pounds)
Husky	95
St. Bernard	145
Cocker Spaniel	55
Yorkie	3.5

About how many times heavier is the largest dog when compared with the smallest dog?

- A. 3 B. 41
 C. 2 D. 27

Florida State College Review for PERT Mathematics - Part 1

Change the given quantity to the indicated unit.

75. 360 min = _____ hours
 A. 21600 B. 36 C. 6 D. 2
76. 180 in = _____ ft
 A. 60 B. 1.25 C. 540 D. 15

77. The following table is used to determine the minimum payment on a credit card bill.

Balance	\$0-25	\$25.01-250	\$250.01-1000	\$1000.01 up
Min. Payment	Full Balance	\$25	10% of balance	\$100 + 5% of balance greater than \$1000

What is the minimum payment if you owe \$300?

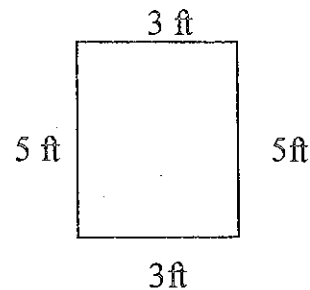
- A. \$300 B. \$45 C. \$25 D. \$30

Find the square root of each of the problems below.

78. $\sqrt{64}$
 A. 16 B. 9 C. 32 D. 8
79. $\sqrt{121}$
 A. 121 B. 60.5 C. 11 D. 12

Find the perimeter of the figure below.

80.



- A. 16 ft B. 8 ft
 C. 9 ft D. 25 ft

Solutions:

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

Pre Algebra Practice

1. What is the perimeter of a rectangle that has a length of 9 cm and a width of 6 cm?
 A. 54 sq. cm B. 54 cm
 C. 30 cm D. 30 sq. cm

2. What is the area of a square that has a side length of 15 centimeters?
 A. 225 cm B. 225 sq. cm
 C. 60 sq. cm D. 60 cm

3. What is the area of a triangle that has a base of 9 inches and a height of 10 inches?
 A. 45 in B. 45 sq in
 C. 90 in D. 90 sq in

4. Use order of operations to simplify:
 $(10 - 4 \cdot 2)^3 - 3$
 A. 1725 B. 30
 C. 3 D. 5

5. Use order of operations to simplify:
 $-3 \cdot 2 - (-4)^2 + 2$
 A. 102 B. 16
 C. 12 D. -20

6. Use order of operations to simplify:
 $15 - [4 - 3(2 - 4)]$
 A. 13 B. 1
 C. 5 D. 17

7. Simplify: $|-9| - (-2)$
 A. -11 B. -7
 C. 7 D. 11

8. Simplify: $-4 + |6 - 8|$
 A. -10 B. 10
 C. -2 D. -6

9. Simplify:
 $-4 - 5x^8y + 6xy - 8x^8y + xy - 7$
 A. $-13x^{16}y^2 - 7xy + 11$
 B. $-13x^8y + 7xy - 11$
 C. $3x^8 + 5x^2y^2 + 11$
 D. $3x^8y + 5xy - 11$

10. Simplify: $-\frac{3}{5}x + \frac{1}{2}x$
 A. $-\frac{1}{10}x$ B. $\frac{2}{3}x$
 C. $-\frac{3}{10}x$ D. $\frac{1}{10}x^2$

11. Simplify: $(0.24x)(1.2z)$
 A. 2.88xz B. 0.288xz
 C. 1.44xz D. 1.44 + xz

12. Evaluate the following expression for $x = 3$ and $y = 4$: $x^2 + y^2$
 A. -2 B. 14
 C. -7 D. 25

13. Evaluate the following expression for $x = \frac{2}{3}$ and $y = \frac{1}{2}$: $(x - y)(x + y)$
 A. $\frac{7}{36}$ B. $\frac{4}{3}$
 C. $\frac{3}{5}$ D. $\frac{1}{9}$

14. Evaluate the following expression for $x = 0.2$ and $y = 3.4$: $x(y^2 - 4)$
 A. 223.2 B. 1.512
 C. 0.56 D. 2.304

Florida State College Review for PERT Mathematics -- Part 2

15. Solve for x: $\frac{3}{12}x - 25 = 0$

A. $x = -\frac{125}{12}$ B. $x = 60$

C. $x = -60$ D. $\frac{125}{12}$

16. Solve for x: $-x + 3 = 7x + 8$

A. $x = -\frac{5}{8}$ B. $x = \frac{6}{5}$

C. $x = \frac{1}{3}$ D. $x = \frac{6}{11}$

17. Solve for x: $5(3 - 4x) = 7 - (4 - x)$

A. $x = 3$ B. $x = -\frac{18}{5}$

C. $x = \frac{4}{7}$ D. $x = -\frac{19}{8}$

18. Solve for y: $\frac{3}{4} + y = \frac{5}{3}$

A. $y = \frac{20}{9}$ B. $y = -2$

C. $y = \frac{11}{12}$ D. $y = \frac{29}{12}$

19. Solve for z: $\frac{6}{5}z = \frac{4}{7}$

A. $z = -\frac{22}{35}$ B. $z = \frac{62}{35}$

C. $z = \frac{24}{35}$ D. $z = \frac{10}{21}$

20. Solve for z: $5.6 = 0.02z + 7.38$

A. $z = 0.2596$ B. $z = 649$

C. $z = 0.0356$ D. $z = -89$

21. Solve for x: $\frac{x}{0.08} = 5.8$

A. $x = 5.72$ B. $x = 5.88$

C. $x = 72.5$ D. $x = 0.464$

22. The formula for the perimeter of a rectangle is: $P = 2L + 2W$

Solve for W when $P = 23$ and $L = 7$.

A. $W = 4.5$ B. $W = 2$

C. $W = 18.5$ D. $W = 18$

23. Best Buy is selling a television for \$1250.00. Sales tax in Duval County is 6%. Using P as the amount I will have to pay for the television (including sales tax), write an algebraic equation that describes this transaction.

A. $P = (0.06)(1250)$

B. $P = 1250 \div 0.06$

C. $P = 1250 + (0.06)(1250)$

D. $P = 1250(0.94)$

24. Jeremy put \$1250 into his savings account, which pays 5% per year simple interest and left it there for 3 years. Using A as the total amount that will be in the bank at the end of the 3 years, write an algebraic equation that describes this transaction.

A. $A = 1230 + 1250(0.05)(3)$

B. $A = 1250(0.05)(3)$

C. $A = 1250 - 1250(0.05)(3)$

D. $A = 1250 + (0.05)(3)$

25. Keisha is investing her money in an IRA. Initially she will be putting in \$775. Using C as the additional amount invested each month, translate this problem into an algebraic expression that will show how much Keisha invested for the entire year.

A. $775 + C$ B. $775 - 12C$

C. $775C$ D. $775 + 12C$

Florida State College Review for PERT Mathematics -- Part 2

26. Multiply and simplify where possible:

$$3x(7x - 4)$$

- A. $21x^2 - 4$ B. $21x^2 - 12$
 C. $9x^2$ D. $21x^2 - 12x$

27. Multiply and simplify where possible:

$$4x(2y + 3z - 12)$$

- A. $6xy + 12xz - 48$
 B. $8xy + 12xz - 48x$
 C. $8x^2y^2 + 12x^2z^2 + 48$
 D. $8xy + 12xz - 12$

28. Multiply and simplify where possible:

$$xy(6x^2 - 3y^3z)$$

- A. $6x^3y - 3xy^4z$
 B. $7x^3y - 2xy^4z$
 C. $6x^2y - xy^3z$
 D. $3x^3y^4z$

29. Multiply and simplify where possible:

$$(5x - 2)(6x + 3)$$

- A. $30x^2 - 6$
 B. $30x^2 + 3x - 6$
 C. $11x^2 - 5$
 D. $30x^2 + 3x + 5$

30. Multiply and simplify where possible:

$$(z + \frac{3}{4})(z - \frac{3}{4})$$

- A. $z^2 - \frac{3}{4}$ B. $2z$
 C. $z^2 - \frac{2}{3}$ D. $z^2 - \frac{9}{16}$

31. Multiply and simplify where possible:

A. $16x^2 - 4z^2$

B. $8x^2 + 4z^2$

C. $16x^2 + 16xz - 4z^2$

D. $8x^2 + 4z^2$

32. Simplify: $(6x^2 - 3x - 7) + (3x^2 + 5)$

A. $3x^2 - 3x - 2$

B. $9x^2 - 3x - 12$

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

D. $9x^2 - 3x + 12$

33. Simplify: $(z^2 - 3z + 1) - (7z^2 - 8z + 5)$

A. $-6z^2 - 11z + 6$

B. $-6z^2 + 5z - 4$

C. $-6z^2 - 11z - 4$

D. $-7z^2 + 5z - 4$

34. Simplify: $(z^2 + 3) + (4z - 7) - (5z^2 + z - 9)$

A. $-4z^2 + 5z + 5$

B. $-4z^2 + 3z + 5$

C. $-4z^2 + 5z - 13$

D. $-6z^2 + 3z - 13$

Solutions:

- | | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|
| 1. C | 2. B | 3. B | 4. D | 5. D | 6. C | 7. D |
| 8. C | 9. B | 10. A | 11. B | 12. D | 13. A | 14. B |
| 15. B | 16. A | 17. C | 18. C | 19. D | 20. D | 21. D |
| 22. A | 23. C | 24. A | 25. D | 26. D | 27. B | 28. A |
| 29. B | 30. D | 31. A | 32. C | 33. B | 34. B | |

Section 1 Sample Problems

1. Simplify: $2\sqrt{18a^2x^5}$

- A. $36ax^2\sqrt{x}$ B. $18a^2x^4\sqrt{2x}$
 C. $18ax^2\sqrt{2x}$ D. $6ax^2\sqrt{2x}$

2. Simplify: $6\sqrt{5} + \sqrt{6} - 2\sqrt{5}$

- A. $4\sqrt{10} + \sqrt{6}$ B. $4\sqrt{5} + \sqrt{6}$
 C. $5\sqrt{16}$ D. $5\sqrt{6}$

3. Find using the greatest common factor.

$6a^2b^2 + 18ab^3$

- A. $6a^2b^3$ B. $3ab^2$
 C. $6ab$ D. $6ab^2$

4. Factor $x^2 - y^2$.

- A. $xy(x-y)$ B. $(x-y)(x-y)$
 C. $(x+y)(x-y)$ D. not factorable

5. Factor the trinomial $2a^2 + 3a + 1$

- A. $(2a+1)(a+1)$ B. $(a+1)(a+3)$
 C. $(2a+1)(3a+1)$ D. $2(a+1)(a+1)$

6. Simplify: $\frac{x^2y^3}{x^{-3}y^5}$

- A. $\frac{x^5}{y^2}$ B. $\frac{y^2}{x^5}$
 C. $\frac{x^6}{y^2}$ D. xy^3

7. Simplify:

$(5x^3y^0)^{-2}$

- A. $\frac{1}{25x^6}$ B. $\frac{25}{x^5y^2}$
 C. $10x^6$ D. $-10x^{-6}$

8. Find the x and y intercepts and the slope of the given line: $2x + 3y = 12$.

- A. $(6,0), (0,4), \frac{-2}{3}$ B. $(4,0), (0,6), \frac{3}{2}$
 C. $(6,0), (0,4), \frac{3}{2}$ D. $(4,0), (0,6), \frac{-2}{3}$

9. To graph $y = -2x + 3$ you would begin at the y intercept which is:

- A. -2 B. +3
 C. -6 D. 0

10. Solve for x: $\frac{3}{4}x - 5 = 3$

- A. $x = \frac{8}{3}$ B. $x = \frac{3}{32}$
 C. $x = \frac{32}{3}$ D. $x = -\frac{3}{2}$

11. Solve for x: $ax + by = c$

- A. $\frac{a}{c-by}$ B. $\frac{by-c}{a}$
 C. $\frac{c-by}{a}$ D. $\frac{c-by}{a}$

12. Solve for x: $4x^2 + 4x - 35 = 0$

- A. $x = -\frac{7}{2}, x = -\frac{5}{2}$
 B. $x = -\frac{7}{2}, x = \frac{5}{2}$
 C. $x = \frac{7}{2}, x = \frac{5}{2}$
 D. $x = \frac{7}{2}, x = -\frac{5}{2}$

13. Solve for x: $5x - 8 < 11x - 2$

- A. $x < 1$ B. $x > 1$
 C. $x > -1$ D. $x < -1$

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Solutions Section 1 Sample Problems:

- | | | | | | | |
|------|------|------|------|------|------|------|
| 1. D | 2. B | 3. D | 4. C | 5. A | 6. A | 7. A |
| 8. A | 9. B | 10.C | 11.C | 12.B | 13.C | |

Sample Problems Using Radicals

Simplify each problem

1. $\sqrt{12x^2}$ 2. $\sqrt{20a^5} \cdot 2a^2\sqrt{5a}$ 3. $3\sqrt{6} \cdot \sqrt{6}$ 4. $\sqrt{3n} \cdot \sqrt{24n}$

5. $\sqrt{3x} \cdot \sqrt{51x^3}$ 6. $\sqrt{45a^7} \cdot \sqrt{20a}$ 7. $2\sqrt{12} - 7\sqrt{3}$ 8.

9. $4\sqrt{5} - 2\sqrt{45}$ 10. $\sqrt{40a^3b^4}$ 11. $\sqrt{12} + \sqrt{48} - \sqrt{27}$ 12. $(11 - \sqrt{2})^2$

13. $k\sqrt{7x^2} + 4x\sqrt{63k^2}$ 14. $\sqrt{3(\sqrt{7} + \sqrt{2})}$ 15. $2\sqrt{5r(3r + 8\sqrt{2}h)}$

Solutions:

- | | | | | |
|-----------------|-----------------------|--------------------|----------------------------|-----------------------------------|
| 1. $2x\sqrt{3}$ | 2. $20a^5$ | 3. 18 | 4. $6n\sqrt{2}$ | 5. $3x^2\sqrt{17}$ |
| 6. $30a^4$ | 7. $-3\sqrt{3}$ | 8. $9 + \sqrt{3}$ | 9. $-2\sqrt{5}$ | 10. $2ab^2\sqrt{10a}$ |
| 11. $3\sqrt{3}$ | 12. $13 - 2\sqrt{22}$ | 13. $13kx\sqrt{7}$ | 14. $\sqrt{21} + \sqrt{6}$ | 15. $2r\sqrt{15} + 16\sqrt{10hr}$ |

Sample problems using factoring

If necessary find the greatest common factor and then factor completely.

- | | |
|----------------------------------|---------------------|
| 1. $12cd^3 - 8c^2d^2 + 10c^5d^3$ | 2. $y^2 - 5y + 4$ |
| 3. $x^2 - 6x + 9$ | 4. $3m^2 - 3n^2$ |
| 5. $6c^2 + 13c + 6$ | 6. $2b^2 + 13b - 7$ |

Solutions:

- | | |
|-----------------------------|------------------|
| 1. $2cd^2(6d - 4c + 5c^4d)$ | 2. $(y-1)(y-4)$ |
| 3. $(x-3)(x-3)$ | 4. $3(m-n)(m+n)$ |
| 5. $(2c+3)(3c+2)$ | 6. $(2b-1)(b+7)$ |

Sample problems simplifying rational expressions

Factor and reduce each expression to lowest terms.

1. $\frac{30bc}{12b^2}$ 2. $\frac{5t-5}{t^2-1}$ 3. $\frac{y^2+4y+4}{3y^2+5y-2}$ 4. $\frac{a^2+2a+1}{2a^2+3a+1}$

Solutions:

1. $\frac{5c}{2b}$ 2. $\frac{5}{t+1}$ 3. $\frac{y+2}{3y-1}$ 4. $\frac{a+1}{2a+1}$

Sample problems multiplying and dividing rational expressions

1. $\frac{3xyz}{4xz} \cdot \frac{6x^2}{3y^2}$ 2. $\frac{3}{5d} \div \frac{-9}{15df}$
 3. $\frac{4t^2-4}{9(t+1)^2} \cdot \frac{3t+3}{2t-2}$ 4. $\frac{5x^2+10x-75}{4x^2-24x-28} \cdot \frac{2x^2-10x-28}{x^2+7x+10}$
 5. $\frac{a^2+2a-15}{a-3} \div \frac{a^2-4}{2}$

Solutions:

1. $\frac{3x^2}{2y}$ 2. $-f$ 3. $\frac{2}{3}$ 4. $\frac{5(t-3)}{2(t+1)}$ 5. $\frac{2(t+5)}{(t-2)(t+2)}$

Sample problems adding and subtracting rational expressions

1. $\frac{6}{ab} + \frac{8}{a}$ 2. $\frac{m}{m^2-4} + \frac{2}{3m+6}$ 3. $\frac{1}{h^2-9h+20} - \frac{5}{h^2-10h+25}$
 4. $\frac{y+1}{y-1} + \frac{y+2}{y-2} + \frac{y}{y^2-3y+2}$ 5. $\frac{d-4}{d^2+2d-8} - \frac{d+2}{d^2-16}$

Solutions:

1. $\frac{6+8b}{ab}$ 2. $\frac{5m-4}{3(m+2)(m-2)}$ 3. $\frac{-4h+15}{(h-4)(h-5)}$

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4. $\frac{2y^2 + y - 4}{(y-1)(y-2)}$

5. $\frac{-8d + 20}{(d-4)(d+4)(d-2)}$

Sample problems graphing linear equations

1. Give the slope and y intercept of the line determined by the equation $y = 2x - 3$.
2. Give the slope and y intercept of the graph for the equation. $y = -\frac{1}{2}x + \frac{2}{3}$
3. Give the x and y intercepts for the line determined by the equation $-6x + 5y = 2$
4. Graph the equation $y = -2x + 4$ use an x,y coordinate grid.
5. Graph the equation $y = -\frac{3}{2}x - 4$ use an x,y coordinate grid.
6. Graph the equation $3x - 2y = 6$ use an x,y coordinate grid.

Solutions:

1. Slope 2 and y intercept -3
 2. Slope $-\frac{1}{2}$ and y intercept $\frac{2}{3}$
 3. x intercept $-\frac{1}{3}$. Solve for x when $y = 0$ and you get $-\frac{1}{3}$.
Y intercept $\frac{2}{5}$ Solve for y when $x = 0$ and you get $\frac{2}{5}$.
 4. To graph $y = -2x + 4$, begin at the y intercept 4 then count the slope -2 which would be down 2 units and right one unit because all whole numbers have a denominator of 1. Place a point here and connect with the y intercept.
 5. To graph $y = -\frac{3}{2}x - 4$, begin at the y intercept -4 then count the slope $-\frac{3}{2}$ which would be down 3 units and right 2 units. Place a point here and connect with the y intercept.
 6. Use the intercepts to graph this equation. The x intercept is 2 and the y intercept is -3 . Connect the intercepts with a line
-

Sample problems solving quadratic equations

Sample problems involving only a squared variable term.

1. $2x^2 = 8$

2. $(x+3)^2 = 144$

3. $x^2 = 46$

Solutions:

1. ± 2

2. $9, -15$

3. ± 6.78

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Sample problems that can be solved by factoring:

1. $x^2 - 4x - 21 = 0$

2. $x^2 - 4x = 32$

3. $x^2 - 6x - 55 = 0$

Solutions:

1. $x = 7$ or $x = -3$

2. $x = 8$ or $x = -4$

3. $x = -5$ or $x = 11$

Sample problems that can be solved using the quadratic formula.

Write your answers in set notation.

1. $x^2 + 15x + 54 = 0$

2. $x^2 + 4x = 2$

3. $2x^2 - 11x + 15 = 0$

Solutions:

1. $\{-9, -6\}$

2. $\{0.45, -4.45\}$

3. $\{6, 5\}$

Practice for Intermediate Algebra

1. Solve for x: $2 < 3x - 5 < 4$

A. $\frac{7}{3} < x < 3$ B. $-1 < x < -2$

C. $-\frac{7}{3} < x < 3$ D. $-3 < x < \frac{7}{3}$

2. Solve the system of equations:

$2a + b = 5$

$a - b = 1$

A. (-2,1) B. (2,1)

C. (2,-1) D. (-2,-1)

3. Solve the system of equations:

$3x + 5y = 3$

$x = 8 - 4y$

A. (-4,3) B. (3,-4)

C. (4,3) D. (-3,-4)

4. Solve the system of equations:

$6x + 7y = 9$

$8x + 9y = 11$

A. (2,3) B. (-2,-3)

C. (3,-2) D. (-2,3)

5. Simplify: $\frac{x^2 + 9x + 8}{x^2 - 3x - 4}$

A. $\frac{x+1}{x-4}$ B. $\frac{x+8}{x+1}$

C. $\frac{x+8}{x-4}$ D. $\frac{x-8}{x+4}$

6. Simplify:

$\frac{y^2 + 10y + 25}{y^2 - 9} \cdot \frac{y^2 + 3y}{y + 5}$

A. $\frac{y(y+5)}{y+3}$ B. $\frac{y(y+5)}{y-3}$

C. $\frac{y+5}{y-3}$ D. $\frac{y^2 - 5y}{y+3}$

7. Add and simplify: $\frac{9}{x+1} + \frac{3}{x}$

A. $\frac{12x+3}{x(x+1)}$ B. $\frac{12}{x(x+1)}$

C. $\frac{12}{2x+1}$ D. $\frac{15}{x+1}$

8. Simplify:

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

A. $\frac{x}{(x-2)(x+1)}$ B. $\frac{x(x+1)}{(x-2)(x-1)}$

C. $\frac{(x-2)(x+1)}{x(x-1)}$ D. $\frac{x(x-1)}{(x-2)(x+1)}$

9. Simplify:

$\frac{x}{x^2 + 9x + 20} - \frac{4}{x^2 + 7x + 12}$

A. $\frac{(x+5)(x+3)}{x-5}$ B. $\frac{x+5}{(x-5)(x-3)}$

C. $\frac{x-5}{(x+5)(x+3)}$ D. $\frac{x-5}{(x+3)(x+4)(x+5)}$

10. Solve: $\frac{x-1}{x^2-2x-3} + \frac{x+2}{x^2-9} = \frac{2x+5}{x^2+4x+3}$

- A. $x = -\frac{7}{3}$ B. $x = \frac{3}{7}$
 C. $x = -\frac{3}{7}$ D. $x = \frac{7}{3}$

11. If $f(x) = 4x^2 - x + 3$, find $f(-2)$.

- A. 17 B. 21
 C. -11 D. -15

12. If $f(x) = -2x^3 + 5$, find x if $f(x) = -49$.

- A. 2 B. 3
 C. 4 D. -2

13. Given $f(x) = 3x^2 - 2x$, find $f(a+1)$

- A. $3a^2 - 2a + 1$ B. $3a^2 + 4a + 1$
 C. $3a^2 - 2a + 2$ D. $3a^2 - 4a + 4$

14. Simplify (put in rationalized form):

$$\frac{3}{\sqrt{5}}$$

- A. $\frac{3\sqrt{5}}{5}$ B. $\frac{\sqrt{5}}{3}$
 C. 15 D. $\sqrt{15}$

15. Simplify (put in rationalized form):

$$\frac{8}{\sqrt{x+2}}$$

- A. $4\sqrt{x}$ B. $\frac{\sqrt{x}}{16}$
 C. $\frac{8\sqrt{x}-16}{x-4}$ D. $\frac{8x-16}{x+4}$

16. Write a linear equation in standard form that goes through the points (4,-3) and (-2,9):

- A. $x - y = -5$
 B. $y = 2x - 5$
 C. $2x + y = 5$
 D. $2x - y = 5$

17. Write a linear equation in slope-intercept form that is perpendicular to $y = 3x - 4$ and crosses (3,6).

- A. $y = -\frac{1}{3}x + 7$
 B. $y + \frac{1}{3}x = 7$
 C. $x + 3y = 21$
 D. $x = -3y + 21$

Solutions:

1. a 2. b 3. a 4. d 5. c 6. b
 7. a 8. d 9. c 10. a 11. b 12. b
 13. b 14. a 15. c 16. c 17. a