Math 102
Quiz 2 Preparation Ch.1.1 to 1.4 v01
NO BOOK/ NO NOTES/YES CALCUATOR
Dressler Fall 2016

Name_____

Solve the rational equation.

1) $\frac{1}{x-6} = \frac{12}{x^2-36}$ 1) _____

2) $\frac{1}{x-3} = \frac{6}{x^2-9}$ 2) _____

3) $\frac{x+8}{x+2} = \frac{6}{x+2}$ 3) _____

4) $\frac{x+8}{x+3} = \frac{5}{x+3}$ 4) _____

5) $1 + \frac{1}{x} = \frac{56}{x^2}$ 5) _____

6) $1 + \frac{1}{x} = \frac{12}{x^2}$ 6) _____

7) $\frac{1}{x} + \frac{1}{x-5} = \frac{x-4}{x-5}$ 7) _____

8) $\frac{1}{x} + \frac{1}{x+3} = \frac{x+4}{x+3}$ 8) _____

9) $\frac{5x}{x+4} - \frac{20}{x-4} = \frac{5x^2+80}{x^2-16}$ 9) _____

10) $\frac{3x}{x+1} - \frac{3}{x-1} = \frac{3x^2+3}{x^2-1}$ 10) _____

11) $\frac{x+4}{x^2+3x-4} - \frac{4}{x^2+8x+16} = \frac{x-4}{x^2+3x-4}$ 11) _____

12) $\frac{x+8}{x^2-5x+6} - \frac{8}{x^2-4x+4} = \frac{x-8}{x^2-5x+6}$ 12) _____

Solve .

13) $\frac{2}{x+3} - \frac{1}{x-3} = \frac{6}{x^2-9}$ 13) _____

14) $\frac{2}{x+8} - \frac{1}{x-8} = \frac{16}{x^2-64}$ 14) _____

Solve.

15) Kevin invested part of his $10,000 bonus in a certificate of deposit that paid 6% annual interest, and the remainder in a mutual fund that paid 11% annual interest. If his total interest for that year was $900, how much did Kevin invest in the mutual fund? 15) _____

16) Kevin invested part of his $10,000 bonus in a certificate of deposit that paid 6% annual interest, and the remainder in a mutual fund that paid 11% annual interest. If his total interest for that year was $800, how much did Kevin invest in the mutual fund? 16) _____

17) A bank loaned out $53,000, part of it at the rate of 15% per year and the rest at a rate of 4% per year. If the interest received was $5970, how much was loaned at 15%? 17) _____

18) A bank loaned out $65,000, part of it at the rate of 13% per year and the rest at a rate of 5% per year. If the interest received was $5410, how much was loaned at 13%? 18) _____

19) A chemist needs 11 liters of a 50% salt solution. All she has available is a 20% salt solution and a 70% salt solution. How much of each of the two solutions should she mix to obtain her desired solution? 19) _____

20) Sue took her collection of nickels and dimes to deposit in the bank. She has five fewer nickels than dimes. Her total deposit was $60.65. How many dimes did she deposit? 20) _____

21) Sue took her collection of nickels and dimes to deposit in the bank. She has five fewer nickels than dimes. Her total deposit was $43.85. How many dimes did she deposit? 21) _____

22) Molly has $14.95 in coins. She has three more nickels than dimes. She has eight fewer quarters than dimes. How many quarters does she have? 22) _____

23) Molly has $7.45 in coins. She has five more nickels than dimes. She has eight fewer quarters than dimes. How many quarters does she have? 23) _____

24) A chemist needs 10 liters of a 50% salt solution. All she has available is a 20% salt solution and a 70% salt solution. How much of each of the two solutions should she mix to obtain her desired solution? 24) _____

25) A chemist needs 5 liters of a 50% salt solution. All she has available is a 20% salt solution and a 70% salt solution. How much of each of the two solutions should she mix to obtain her desired solution? 25) _____

Factor completely.

26) $(a + 1)^2 - (a + 1) - 56$ 26) _____

27) $(1 + x^2)^2 + 4(1 + x^2) - 96$ 27) _____

28) $(a^2 + 2a)^2 + 11(a^2 + 2a) + 24$ 28) _____

29) $(y + 2)^2 - (y + 2) - 63$ 29) _____

30) $x^2 + 10xy + 24y^2$ 30) _____

31) $u^2 - 7uv - 18v^2$ 31) _____

32) $x^2(y - 9) - 13x(y - 9) + 40(y - 9)$ 32) _____

33) $x^2(y - 10) - 13x(y - 10) + 36(y - 10)$ 33) _____

Factor completely using the grouping method to factor trinomials. If unfactorable, indicate that the polynomial is prime.

34) $5x^2 + 56x + 11$ 34) _____

35) $11x^2 + 122x + 11$ 35) _____

36) $3x^2 + 13x - 10$ 36) _____

37) $3x^2 + 11x + 6$ 37) _____

38) $3x^2 - 17x + 20$ 38) _____

39) $2x^2 - 11x + 15$ 39) _____

Solve the problem.

40) The length of a rectangular storage room is 4 feet longer than its width. If the room's area is 60 square feet, find its length and width. 40) _____

41) The length of a rectangular storage room is 4 feet longer than its width. If the room's area is 140 square feet, find its length and width. 41) _____

42) The length of a rectangular storage room is 6 feet longer than its width. If the room's area is 91 square feet, find its length and width. 42) _____

43) A cyclist bikes at a constant speed for 15 miles. He then returns home at the same speed but takes a different route. His return trip takes one hour longer and is 20 miles. Find his speed. 43) _____

44) A cyclist bikes at a constant speed for 16 miles. He then returns home at the same speed but takes a different route. His return trip takes one hour longer and is 21 miles. Find his speed. 44) _____

45) A car travels 400 miles on level terrain in the same amount of time it travels 160 miles on mountainous terrain. If the rate of the car is 30 miles per hour less in the mountains than on level ground, find its rate in the mountains. 45) _____

46) A boat moves 7 kilometers upstream in the same amount of time it moves 17 kilometers downstream. If the rate of the current is 8 kilometers per hour, find the rate of the boat in still water. 46) _____

47) A boat moves 5 kilometers upstream in the same amount of time it moves 16 kilometers downstream. If the rate of the current is 7 kilometers per hour, find the rate of the boat in still water. 47) _____

48) Jim can run 5 miles per hour on level ground on a still day. One windy day, he runs 10 miles with the wind, and in the same amount of time runs 5 miles against the wind. What is the rate of the wind? 48) _____

49) A painter can finish painting a house in 5 hours. Her assistant takes 7 hours to finish the same job. How long would it take for them to complete the job if they were working together? 49) _____

50) A painter can finish painting a house in 6 hours. Her assistant takes 8 hours to finish the same job. How long would it take for them to complete the job if they were working together? 50) _____

51) BJ can overhaul a boat's diesel inboard engine in 30 hours. His apprentice takes 60 hours to do the same job. How long would it take them working together assuming no gain or loss in efficiency? 51) _____

52) A painter can finish painting a house in 8 hours. Her assistant takes 10 hours to finish the same job. How long would it take for them to complete the job if they were working together? 52) _____

53) BJ can overhaul a boat's diesel inboard engine in 20 hours. His apprentice takes 60 hours to do the same job. How long would it take them working together assuming no gain or loss in efficiency? 53) _____

54) BJ can overhaul a boat's diesel inboard engine in 15 hours. His apprentice takes 30 hours to do the same job. How long would it take them working together assuming no gain or loss in efficiency? 54) _____

1) ∅
2) ∅
3) ∅
4) ∅
5) {–8, 7}
6) {–4, 3}
7) {1}
8) {1}
9) ∅
10) ∅
11) {–9}
12) {1}
13) {15}
14) {40}
15) $6000
16) $4000
17) $35,000
18) $27,000
19) 4.4 liters of the 20% solution; 6.6 liters of the 70% solution
20) 406 dimes
21) 294 dimes
22) 34 quarters
23) 15 quarters
24) 4 liters of the 20% solution; 6 liters of the 70% solution
25) 2 liters of the 20% solution; 3 liters of the 70% solution
26) ((a + 1)+ 7)((a + 1) – 8)
27) $((1 + x^2) + 12)((1 + x^2) – 8)$
28) $((a^2 + 2a) + 3)((a^2 + 2a) + 8)$
29) Prime
30) (x + 4y)(x + 6y)
31) (u + 2v)(u – 9v)
32) (x – 8)(x – 5)(y – 9)
33) (x – 9)(x – 4)(y – 10)
34) (5x + 1)(x + 11)
35) (11x + 1)(x + 11)
36) (3x – 2)(x + 5)
37) (3x + 2)(x + 3)
38) prime
39) prime
40) width: 6 ft, length: 10 ft
41) width: 10 ft, length: 14 ft
42) width: 7 ft, length: 13 ft
43) 5 mph
44) 5 mph
45) 20 mph
46) $19\frac{1}{5}$ kilometers per hour
47) $13\frac{4}{11}$ kilometers per hour

48) $1\frac{2}{3}$ mph

49) $2\frac{11}{12}$ hours

50) $3\frac{3}{7}$ hours

51) 20 hr

52) $4\frac{4}{9}$ hours

53) 15 hr

54) 10 hr