

Name \_\_\_\_\_

To receive full credit for the assignment you must show your work (write the steps to arrive at each answer).  
You should attach extra sheets, if necessary, to show your work properly.

Simplify.

1)  $\frac{4 + \frac{2}{s}}{\frac{s}{3} + \frac{1}{6}}$  1) \_\_\_\_\_

A) 12

B)  $\frac{12}{s}$

C) 1

D)  $\frac{s}{12}$

2)  $\frac{\frac{2}{x} + \frac{3}{y}}{\frac{3}{x} - \frac{2}{y}}$  2) \_\_\_\_\_

A) -y

B)  $\frac{2y + 3x}{3y - 2x}$

C)  $\frac{x + y}{y - 1}$

D)  $\frac{y + x}{x}$

$$3) \frac{\frac{25r^2 - 49s^2}{rs}}{\frac{5}{s} - \frac{7}{r}}$$

3) \_\_\_\_\_

A)  $5r + 7s$

B)  $\frac{7r + 5s}{rs}$

C)  $7r + 5s$

D)  $\frac{rs}{5r + 7s}$

$$4) \frac{6 + \frac{1}{3}}{2 - \frac{2}{9}}$$

4) \_\_\_\_\_

A)  $\frac{57}{16}$

B)  $\frac{171}{16}$

C)  $\frac{57}{8}$

D)  $\frac{171}{32}$

$$5) \frac{\frac{1}{k+6}}{\frac{3}{k^2 - 36}}$$

5) \_\_\_\_\_

A)  $k - 6$

B)  $\frac{k - 6}{3}$

C)  $\frac{3}{k - 6}$

D)  $\frac{k + 6}{3}$

$$6) \frac{\frac{1}{x^2 - 9x + 20} + \frac{1}{x^2 - 16}}{\frac{1}{x^2 + 8x + 16} + \frac{1}{x^2 - 16}}$$

6) \_\_\_\_\_

A)  $\frac{(2x - 1)(x + 4)}{x(x - 5)}$

B)  $\frac{x - 4}{x + 4}$

C)  $\frac{(x - 1)(x + 4)}{2x(x - 5)}$

D)  $\frac{(2x - 1)(x + 4)}{2x(x - 5)}$

$$7) \frac{\frac{x^2 - 9}{x^2 + 5x + 6}}{\frac{x^2 - 7x - 18}{x^2 - 2x - 8}}$$

7) \_\_\_\_\_

A)  $\frac{(x + 3)(x - 4)}{(x - 2)(x - 9)}$

B)  $\frac{(x - 3)(x + 4)}{(x + 2)(x + 9)}$

C)  $\frac{(x - 3)(x - 4)}{(x + 2)(x - 9)}$

D)  $\frac{(x + 3)(x - 4)}{(x - 2)(x + 9)}$

For the given rational function  $f$ , find all values of  $x$  for which  $f(x)$  has the indicated value.

8)  $f(x) = \frac{x+1}{x-4}$ ;  $f(x) = \frac{4}{9}$

8) \_\_\_\_\_

A) 5

B)  $\frac{1}{5}$

C) -5

D)  $-\frac{1}{5}$

9)  $f(x) = 4x + \frac{7}{x}$ ;  $f(x) = -29$

9) \_\_\_\_\_

A)  $-\frac{1}{4}, -7$

B) -4, -7

C)  $\frac{1}{4}, 7$

D)  $-\frac{7}{4}, -1$

Solve.

10)  $\frac{5}{x} + \frac{7}{8} = 1$

10) \_\_\_\_\_

A) 12

B) 40

C)  $\frac{3}{2}$

D) 8

$$11) \frac{z+1}{z+2} = \frac{2}{3}$$

11) \_\_\_\_\_

A) 1

B) -3

C) 3

D) -1

$$12) \frac{y-1}{y+10} = \frac{9}{y+10}$$

12) \_\_\_\_\_

A)  $\frac{1}{10}$

B) No solution

C) -10

D) 10

$$13) \frac{7}{x} - \frac{2}{x} = 4$$

13) \_\_\_\_\_

A)  $\frac{5}{4}$

B)  $\frac{4}{5}$

C)  $\frac{5}{9}$

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

$$14) \frac{x}{2} - \frac{x}{5} = 7$$

14) \_\_\_\_\_

A) 10

B) 35

C) 14

D)  $\frac{70}{3}$

$$15) \frac{4}{y+3} - \frac{6}{y-3} = \frac{4}{y^2-9}$$

15) \_\_\_\_\_

A) 29

B) 34

C) -17

D) 17

$$16) \frac{1}{x+6} + \frac{2}{x+3} = \frac{-3}{x^2+9x+18}$$

16) \_\_\_\_\_

A) 0

B) -6

C) 3

D) no solution

$$17) \frac{x}{2x-6} = \frac{-3x}{6x-18} + \frac{2x-5}{x-3}$$

17) \_\_\_\_\_

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

B) -5

C)  $\frac{5}{2}$

D) 5

18) One person can clean the house three times faster than another. Working together they can clean the entire house in 3 hours. How long would it take the faster person cleaning alone?

18) \_\_\_\_\_

A) 3 hr

B) 4 hr

C)  $\frac{3}{4}$  hr

D) 5 hr

- 19) Amy can clean the house in 9 hours. When she works together with Tom, the job takes 5 hours. How long would it take Tom, working by himself, to clean the house? 19) \_\_\_\_\_
- A)  $12\frac{1}{4}$  hr
- B)  $11\frac{1}{4}$  hr
- C)  $11\frac{1}{2}$  hr
- D) 4 hr
- 20) Martha can rake the leaves in her yard in 3 hours. Her younger brother can do the job in 5 hours. How long will it take them to do the job if they work together? 20) \_\_\_\_\_
- A)  $\frac{8}{15}$  hr
- B)  $1\frac{7}{8}$  hr
- C) 5 hr
- D)  $7\frac{1}{2}$  hr
- 21) To determine the number of fish in a lake, a park ranger catches 220 fish, tags them, and returns them to the lake. Later, 108 fish are caught, and it is found that 40 of them are tagged. Estimate the number of fish in the lake. 21) \_\_\_\_\_
- A) 950,400
- B) 81
- C) 20
- D) 594
- 22) On a map, the length of a nature-center trail is 9.8 centimeters. If the scale is 3 centimeters to 32 kilometers, what is the actual length of the trail? Round to the nearest tenth if necessary. 22) \_\_\_\_\_
- A) 105.5 kilometers
- B) 104.5 kilometers
- C) 209 kilometers
- D) 108.5 kilometers

- 23) The current in a stream moves at a rate of 5 mph. If a boat travels 42 miles downstream in the same time that it takes to travel 21 miles upstream, what is the speed of the boat in still water? 23) \_\_\_\_\_
- A) 15 mph
  - B) 10 mph
  - C) 17 mph
  - D) 18 mph

- 24) A boat moves at a rate of 15 mph in still water. It travels 160 miles upstream in the same time that it takes to travel 240 miles downstream. What is the speed of the current? 24) \_\_\_\_\_
- A) 8 mph
  - B) 2 mph
  - C) 3 mph
  - D) 1 mph

**Solve the formula for the specified letter.**

- 25)  $A = \frac{1}{2}h(B + b)$  for B 25) \_\_\_\_\_
- A)  $B = \frac{2A - bh}{h}$
  - B)  $B = \frac{2A + bh}{h}$
  - C)  $B = \frac{A - bh}{h}$
  - D)  $B = 2A - bh$



26)  $\frac{1}{a} + \frac{1}{b} = c$  for b

26) \_\_\_\_\_

A)  $b = \frac{1}{c} - a$

B)  $b = \frac{a}{ac - 1}$

C)  $b = ac - \frac{1}{a}$

D)  $b = \frac{1}{ac}$

27)  $I = \frac{E}{R + r}$  for r

27) \_\_\_\_\_

A)  $r = \frac{E - R}{I}$

B)  $r = \frac{IR}{E}$

C)  $r = \frac{E - IR}{I}$

D)  $r = \frac{E}{I} - IR$

28)  $P = \frac{A}{1 + rt}$  for r

28) \_\_\_\_\_

A)  $r = P - tA$

B)  $r = \frac{P - A}{1 + t}$

C)  $r = \frac{P - 1}{At}$

D)  $r = \frac{A - P}{Pt}$

**Find the equation of variation if the following is true.**

29) Suppose that  $y$  varies directly as  $z$  and  $y = 21$  when  $z = 63$ .

29) \_\_\_\_\_

A)  $y = -2z$

B)  $y = 3z$

C)  $y = \frac{1}{3}z$

D)  $y = -\frac{1}{2}z$

30) Suppose  $y$  varies directly as  $x$  and  $y = 0.1$  when  $x = 0.8$ .

30) \_\_\_\_\_

A)  $y = \frac{1}{8}x$

B)  $y = -0.7x$

C)  $y = 8x$

D)  $y = 0.9x$

31) Suppose  $p$  varies directly as  $q$  and  $p = 1$  when  $q = \frac{1}{12}$ .

31) \_\_\_\_\_

A)  $p = 12q$

B)  $p = 13q$

C)  $p = 11q$

D)  $p = \frac{1}{12}q$

32) Suppose  $m$  varies directly as  $p$  and  $m = 42$  when  $p = 7$ .

32) \_\_\_\_\_

A)  $m = 6p$

B)  $m = 49p$

C)  $m = \frac{1}{6}p$

D)  $m = 35p$

**Solve.**

33) The distance  $D$  that a spring is stretched by a hanging object varies directly as the weight  $W$  of the object. If a 3-kg object stretches a spring 27 cm, find the distance when the weight is 2-kg. Round to the nearest hundredths when necessary. 33) \_\_\_\_\_

- A) 32 cm
- B) 9 cm
- C) 18 cm
- D) 0.22 cm

34) The number  $G$  of gears a machine can make varies directly as the time  $T$  it operates. If it can make 2818 gears in 9 hours, how many gears can it make in 10 hours? 34) \_\_\_\_\_

- A) 0.0319 gears
- B) 3131.11 gears
- C) 2837 gears
- D) 313.11 gears

**Find an equation of variation in which  $y$  varies inversely as  $x$  and the following is true.**

35)  $y = 39$ , when  $x = 5$  35) \_\_\_\_\_

- A)  $y = \frac{44}{x}$
- B)  $y = \frac{195}{x}$
- C)  $y = \frac{7.8}{x}$
- D)  $y = 7.8x$

36)  $y = 0.5$ , when  $x = 0.7$  36) \_\_\_\_\_

- A)  $y = \frac{0.35}{x}$
- B)  $y = 0.71x$
- C)  $y = \frac{1.2}{x}$
- D)  $y = \frac{0.71}{x}$

37)  $y = 0.75$ , when  $x = 8$

37) \_\_\_\_\_

A)  $y = \frac{9}{x}$

B)  $y = \frac{7}{x}$

C)  $y = \frac{6}{x}$

D)  $y = 6x$

38)  $y = 8$ , when  $x = 12$

38) \_\_\_\_\_

A)  $y = \frac{96}{x}$

B)  $y = \frac{0.67}{x}$

C)  $y = \frac{20}{x}$

D)  $y = 96x$

**Solve.**

39) The pitch  $P$  of a musical tone varies inversely as its wavelength  $W$ . One tone has a pitch of 433 vibrations per second and a wavelength of 9.3 ft. Find the wavelength of another tone that has a pitch of 477 vibrations per second. Round to the nearest hundredths when necessary.

39) \_\_\_\_\_

A) 22,208.71 ft

B) 8.44 ft

C) 0.12 ft

D) 0.84 ft

- 40) The speed of a vehicle is inversely proportional to the time it takes to travel a fixed distance. If a vehicle travels a fixed distance at 25 miles per hour in 30 minutes, how fast must it travel to cover the same distance in 50 minutes? 40) \_\_\_\_\_
- A) 15 miles per hour
- B)  $\frac{3}{125}$  miles per hour
- C)  $\frac{125}{3}$  miles per hour
- D) 60 miles per hour
- 41) The gravitational attraction A between two masses varies inversely as the square of the distance between them. The force of attraction is 2.25 lb when the masses are 4 ft apart, what is the attraction when the masses are 6 ft apart? 41) \_\_\_\_\_
- A) 2 lb
- B) 1 lb
- C) 3 lb
- D) 4 lb
- 42) The number of miles per gallon of gasoline that a car averages varies inversely as the average speed the car travels. A car gets 30 miles per gallon at 35 mph. How many miles per gallon will it get at 53 mph? 42) \_\_\_\_\_
- A) 45.4 miles per gallon
- B) 19.8 miles per gallon
- C) 0.02 miles per gallon
- D) 0.05 miles per gallon

## Answer Key

Testname: 11FALL\_BCCM203\_CH5\_PROBS2

- 1) B
- 2) B
- 3) A
- 4) A
- 5) B
- 6) D
- 7) C
- 8) C
- 9) A
- 10) B
- 11) A
- 12) D
- 13) A
- 14) D
- 15) C
- 16) D
- 17) D
- 18) B
- 19) B
- 20) B
- 21) D
- 22) B
- 23) A
- 24) C
- 25) A
- 26) B
- 27) C
- 28) D
- 29) C
- 30) A
- 31) A
- 32) A
- 33) C
- 34) B
- 35) B
- 36) A
- 37) C
- 38) A
- 39) B
- 40) A
- 41) B
- 42) B