MAT 1033 C Lial
Chapter 7
Practice for the test

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

Tell whether or not the rational expressions are equivalent.

1) $\frac{-2x^3 + 7x^2 + 15x}{x^2 - 8x + 15}, \frac{(-x)(2x + 3)}{x + 3}$ 1) _____

A) No B) Yes

2) $\frac{x - 4}{4 - x}, \frac{1}{x - 4}$ 2) _____

A) No B) Yes

Find all numbers not in the domain of the function.

3) $f(x) = \frac{x^2 - 64}{x^2 - 2x - 48}$ 3) _____

A) 8, –8 B) –6, 8 C) 6, –8 D) 0

4) $f(x) = \frac{x - 6}{2}$ 4) _____

A) 0 B) –6 C) 6 D) None

5) $f(x) = \frac{x^2 - 49}{x^2 + 2x - 15}$ 5) _____

A) 0 B) –3, 5 C) 7, –7 D) 3, –5

Find the domain of the rational function.

6) $g(a) = \frac{2a + 22}{a^2 - 9}$ 6) _____

A) $\{a \mid a \neq 3, -3, -11\}$ B) $\{a \mid a \neq 3\}$
C) $\{a \mid a \neq 3, -3\}$ D) $(-\infty, \infty)$

7) $h(x) = \frac{5}{x^2 + 12x + 35}$ 7) _____

A) $\{x \mid x \neq 0\}$ B) $\{x \mid x \neq 0, -7\}$ C) $\{x \mid x \neq 5, 7\}$ D) $\{x \mid x \neq -7, -5\}$

Perform the indicated operation and express in lowest terms.

8) $\frac{6p - 6}{p} \cdot \frac{5p^2}{8p - 8}$ 8) _____

A) $\frac{30p^3 - 30p^2}{8p^2 - 8p}$ B) $\frac{4}{15p}$

C) $\frac{15p}{4}$ D) $\frac{48p^2 + 96p + 48}{5p^3}$

9) $\frac{k^2 + 10k + 16}{k^2 + 13k + 40} \cdot \frac{k^2 + 5k}{k^2 - 2k - 8}$ 9) _____

A) $\frac{k^2 + 5k}{k - 4}$ B) $\frac{1}{k - 4}$ C) $\frac{k}{k^2 + 13k + 40}$ D) $\frac{k}{k - 4}$

10) $\frac{7p - 7}{p} \div \frac{8p - 8}{2p^2}$ 10) _____

A) $\frac{56p^2 + 112p + 56}{2p^3}$ B) $\frac{4}{7p}$

C) $\frac{14p^3 - 14p^2}{8p^2 - 8p}$ D) $\frac{7p}{4}$

11) $\frac{(2x - 7)(x + 2)}{(x + 8)(x - 3)} \div \frac{(x + 2)(3x + 7)}{(x + 8)(x - 3)}$ 11) _____

A) $\frac{x - 8}{x + 2}$ B) $\frac{2x - 7}{3x + 7}$ C) $-\frac{2x - 7}{3x + 7}$ D) $\frac{2}{3}$

12) $\frac{5x^2 - 14xy - 3y^2}{y^2 + 4xy - 5x^2} \cdot \frac{y^2 + 3xy - 4x^2}{15x^2 + 8xy + y^2} \div \frac{4x^2 - 11xy - 3y^2}{15x^2 + 2xy - y^2}$ 12) _____

A) $\frac{x - 3y}{y + 5x}$ B) $\frac{5x - y}{5x + y}$ C) 1 D) $\frac{(y + 4x)^2}{2x - y}$

13) $\frac{m^2 - 7m}{m - 2} + \frac{10}{m - 2}$ 13) _____

A) $m + 5$ B) $m - 2$ C) $m - 5$ D) $\frac{m^2 - 7m + 10}{m - 2}$

14) $\frac{7}{4x^2} + \frac{3}{4x^2}$ 14) _____

A) $\frac{5}{2x^2}$ B) $\frac{2}{5x^2}$ C) 5 D) $\frac{5}{2x^4}$

Assume that the expressions given are denominators of fractions. Find the least common denominator.

15) $7a + 21$, $a^2 + 3a$ 15) _____

A) $7a^2 + 21$ B) $7a^2 + 3$ C) $7a + 3$ D) $7a(a + 3)$

16) $m^2 + 5m$, $m^2 + 2m - 15$ 16) _____

A) $m(m + 8)^2$ B) $(m + 8)^2$

C) $m(m + 5)(m - 3)$ D) $m(m + 8)(m - 3)$

17) $7y + 42$, $y^2 - 36$, y 17) _____

A) $42y(y + 6)^2(y - 6)$ B) $y(y + 6)(y - 6)$

C) $42y(y^2 + 6)(y^2 - 6)$ D) $7y(y + 6)(y - 6)$

Add or subtract as indicated. Write the answer in lowest terms.

18) $\frac{x}{x^2 - 16} - \frac{4}{x^2 + 5x + 4}$ 18) _____

A) $\frac{x^2 - 3x + 16}{(x - 4)(x + 4)(x + 1)}$

B) $\frac{x^2 - 3}{(x - 4)(x + 4)(x + 1)}$

C) $\frac{x^2 - 3x + 16}{(x - 4)(x + 4)}$

D) $\frac{x^2 + 3x + 16}{(x - 4)(x + 4)(x + 1)}$

19) $\frac{3}{10x} + \frac{9}{14x^2}$ 19) _____

A) $\frac{12}{10x + 14x^2}$ B) $\frac{12}{140x^2}$ C) $\frac{108}{70x^2}$ D) $\frac{3(7x + 15)}{70x^2}$

20) $\frac{1}{6x^5y^2} - \frac{11}{2xy}$ 20) _____

A) $\frac{7 - 33x^5y}{6x^6y^3}$ B) $\frac{1 - 33xy}{6x^5y^2}$ C) $\frac{1 - 33x^4y}{6x^5y^2}$ D) $\frac{5 - 33x^6}{6x^5y}$

21) $\frac{2ab}{a^2 - b^2} - \frac{b}{a - b} + 4$ 21) _____

A) $\frac{4a + 5b}{a^2 - b^2}$

B) $\frac{(a - b)(5a + 5b)}{a^2 - b^2}$

C) $\frac{4a + 5b}{a + b}$

D) $\frac{2ab - b + 4}{a + b + 1}$

22) $\frac{1}{x - 3} - \frac{5}{3 - x}$ 22) _____

A) $\frac{6}{x - 3}$ B) -1 C) $\frac{8}{x - 3}$ D) $\frac{-4}{x + 3}$

Find the requested expression for the function.

23) A cost–benefit model expresses the cost of an undertaking in terms of the benefits received. One cost–benefit model gives the cost in thousands of dollars to clean up x percent of an oil spill as $c(x) = \frac{7.1x}{50 - x}$. Another model produces the relationship $c(x) = \frac{7.6x}{59 - x}$. Find the cost function found by averaging the two models. Simplify the expression for this function by performing the indicated operations. 23) _____

A) $c(x) = \frac{798.9x - 14.7x^2}{(50 - x)(59 - x)}$

B) $c(x) = \frac{783.7x - 15.7x^2}{(50 - x)(59 - x)}$

C) $c(x) = \frac{798.9x - 14.7x^2}{2(50 - x)(59 - x)}$

D) $c(x) = \frac{1597.8x - 29.4x^2}{(50 - x)(59 - x)}$

Add or subtract as indicated. Write the answer in lowest terms.

24) $\frac{5}{r} + \frac{8}{r - 5}$ 24) _____

A) $\frac{13r - 25}{r(5 - r)}$ B) $\frac{13r - 25}{r(r - 5)}$ C) $\frac{25r - 13}{r(5 - r)}$ D) $\frac{25r - 13}{r(r - 5)}$

Simplify the complex fraction.

25) $\frac{\frac{y}{8}}{\frac{9}{y - 3}}$ 25) _____

A) $72y(y - 3)$ B) $\frac{9y}{8(y - 3)}$ C) $\frac{y(y - 3)}{72}$ D) $\frac{y - 3}{72y}$

26) $\frac{4 + \frac{2}{x}}{\frac{x}{3} + \frac{1}{6}}$ 26) _____

A) 1 B) 12 C) $\frac{x}{12}$ D) $\frac{12}{x}$

27) $\frac{\frac{9s^2 - 25t^2}{st}}{\frac{3}{t} - \frac{5}{s}}$ 27) _____

A) $3s + 5t$ B) $\frac{st}{3s + 5t}$ C) $\frac{5s + 3t}{st}$ D) $5s + 3t$

Simplify the expression, using only positive exponents in your answer.

28) $\frac{x^{-2}}{x^{-2} - y^{-2}}$ 28) _____

A) $\frac{y^2}{y^2 + x^2}$ B) $\frac{y^2}{y^2 - x^2}$ C) $\frac{y}{y^2 - x^2}$ D) $\frac{y^2 - x^2}{y^2}$

Without actually solving the equation, list all possible numbers that would have to be rejected if they appeared as potential solutions.

29) $\frac{20}{x + 12} - \frac{5}{x + 10} = 0$ 29) _____

A) 12, 10 B) 12, 10, –20, –5 C) –12, –10, 20, 5 D) –12, –10

30) $\frac{13}{5x} + \frac{11}{13x} = \frac{x}{4}$ 30) _____

A) 5, 13
B) 0
C) 5, 13, 4
D) There are no numbers that would have to be rejected.

Solve the equation.

31) $1 + \frac{1}{x} = \frac{90}{x^2}$ 31) _____

A) $\left\{-\frac{1}{10}, \frac{1}{9}\right\}$ B) {9, 10} C) {−10, 9} D) {−9, 10}

32) $\frac{7}{x - 4} = 1 + \frac{9}{x + 4}$ 32) _____

A) {−9, 10} B) {−8, 10} C) ∅ D) {8, −10}

33) $\frac{2}{x - 2} + \frac{10}{x} = \frac{-20}{x^2 - 2x}$ 33) _____

A) ∅ B) {−2} C) {0, 2} D) {0}

34) $\frac{4x - 5}{2x + 1} = \frac{2x - 1}{x + 2}$ 34) _____

A) $\{3\}$ B) $\left\{-\frac{11}{3}\right\}$ C) ∅ D) $\left\{\frac{13}{3}\right\}$

35) $\frac{1}{w + 6} + \frac{1}{3w - 8} = \frac{-26}{3w^2 + 10w - 48}$ 35) _____

A) {−6} B) ∅ C) {−3} D) $\left\{\frac{8}{3}, -6\right\}$

Solve the problem. Round your answer, as needed.

36) A formula for electric circuits is $\frac{1}{a} = \frac{1}{b} + \frac{1}{c}$. If a = 13 and b = 14, find c. 36) _____

A) 182 B) 0.005 C) 1.077 D) 0.929

37) A gas law in chemistry says that $\frac{PV}{T} = \frac{pv}{t}$. If T = 250, t = 330, V = 9, P = 30, and v = 6, find the 37) _____

value of p.

A) 360 B) 59.4 C) 5.94 D) 0.18

Solve the formula for the specified variable.

38) $\frac{PV}{T} = \frac{pv}{t}$ for P 38) _____

A) $P = \frac{pvT}{tV}$ B) $P = \frac{pvV}{tT}$ C) $P = \frac{pv}{tTV}$ D) $P = \frac{tvT}{pV}$

39) $P = \frac{A}{1 + rt}$ for r 39) _____

A) r = P − tA B) $r = \frac{A - P}{Pt}$ C) $r = \frac{P - 1}{At}$ D) $r = \frac{P - A}{1 + t}$

40) $\frac{1}{a} + \frac{1}{b} = \frac{1}{c}$ for c 40) _____

A) c = ab(a + b) B) c = a + b C) $c = \frac{ab}{a + b}$ D) $c = \frac{a + b}{ab}$

Solve the problem. Round your answer, as needed.

41) Maria and Charlie can deliver 40 papers in 4 hours. How long would it take them to deliver 44 papers? 41) _____

A) 176 hours B) 5.5 hours C) 3.6 hours D) 4.4 hours

42) A machine can fill 8172 boxes of cereal in 0.9 hour. How many boxes of cereal can it fill per hour? 42) _____

A) 8172 boxes B) 8173 boxes C) 7355 boxes D) 9080 boxes

Solve the problem.

43) One maid 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 maid cleaning alone? 43) _____

A) $\frac{3}{4}$ hr B) 4 hr C) 5 hr D) 3 hr

44) An experienced accountant can balance the books twice as fast as a new accountant. Working together it takes the accountants 12 hours. How long would it take the experienced accountant working alone? 44) _____

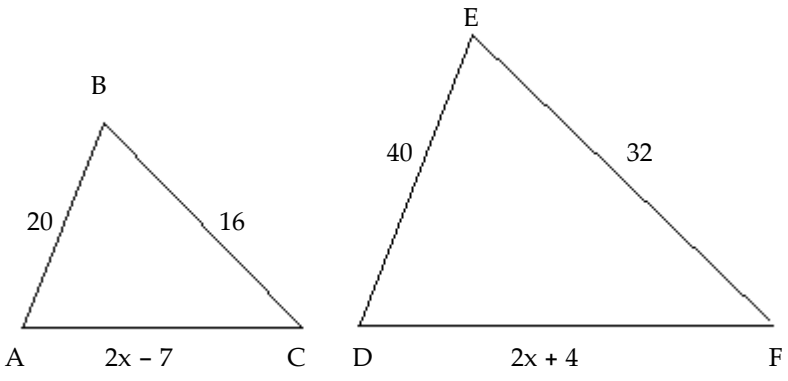
A) 24 hr B) 30 hr C) 6 hr D) 18 hr

45) Martha can rake the leaves in her yard in 5 hours. Her younger brother can do the job in 6 hours. How long will it take them to do the job if they work together? 45) _____

A) $\frac{30}{11}$ hr B) 6 hr C) $\frac{11}{30}$ hr D) 30 hr

Suppose the triangles shown are similar, with angle A = angle D, angle B = angle E, and angle C = angle F. Answer the question.

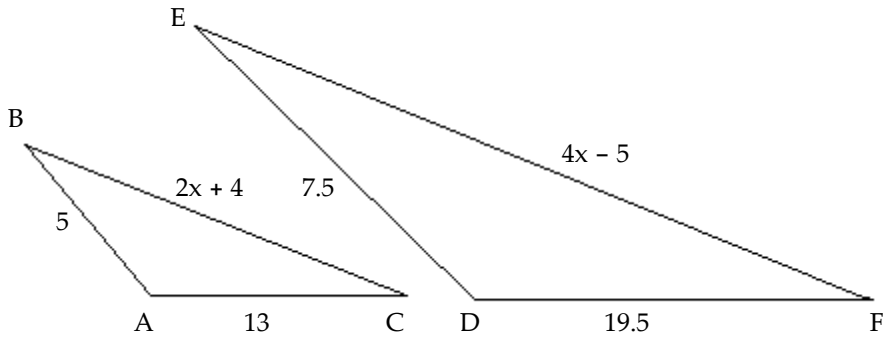
46) 46) _____



What is the value of x?

A) 36 B) 20 C) 16 D) 9

47) 47) _____



What is the length of side EF?

A) $\frac{1}{2}$ B) 139 C) 39 D) 87

Solve the problem.

48) Chuck and Dana agree to meet in Chicago for the weekend. Chuck travels 164 miles in the same time that Dana travels 140 miles. If Chuck's rate of travel is 6 mph more than Dana's, and they travel the same length of time, at what speed does Chuck travel? 48) _____

A) 35 mph B) 39 mph C) 43 mph D) 41 mph

Answer Key
Testname: CHAPTER 7 PRACTICE FOR THE TEST

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