Chapter 8 Practice Tizzy Quest

SCORE _____

1. For what value(s) of x is the expression $\dfrac{x^2 - 9}{2x^2 - 3x - 9}$ undefined?

1. _____ $x = 3, -3/2$ _____

Simplify each expression.

2. $\dfrac{x^3}{x^2 - 64} \div \dfrac{x^3}{x + 8}$

2. _____ $\dfrac{1}{x - 8}$ _____

3. $\dfrac{3b^2 + 3b - 6}{b^2 - 6b + 5} \cdot \dfrac{b^2 - 25}{6b + 12}$

3. _____ $\dfrac{b + 5}{2}$ _____

4. $\dfrac{\frac{3m^2 - 75}{6m^2 + 30m}}{\frac{4m - 20}{9m^2 + 45m}}$

4. _____ $\dfrac{9(m + 5)}{8}$ _____

5. $\dfrac{2}{x - 2} - \dfrac{8}{x^2 - 4}$

5. _____ $\dfrac{2x - 4}{(x - 2)(x + 2)}$ or $\dfrac{2}{x + 2}$ _____

6. $\dfrac{5}{3m - 1} - \dfrac{2}{1 - 3m}$

6. _____ $\dfrac{7}{3m - 1}$ _____

Find the LCM of each set of polynomials.

7. $4m^3p,\ 9mp^4,\ 18m^4p^2$

7. _____ $36m^4p^4$ _____

8. $n^2 - 2n - 8,\ n^2 + 2n - 24$

8. _____ $(n - 4)(n + 2)(n + 6)$ _____

For Questions 9 and 10, determine the equations of any vertical asymptotes and the values of x for any points of discontinuity in the graph of each rational function.

9. $f(x) = \dfrac{x + 1}{x - 3}$

9. _____ $V.A\ x = 3$ _____

10. $f(x) = \dfrac{x^2 - 2x - 8}{x + 2}$

10. _____ $x = -2$ _____

11. Graph $f(x) = \dfrac{x + 3}{(x - 2)(x + 1)}$

11.

This will be hard to figure out just choose points!
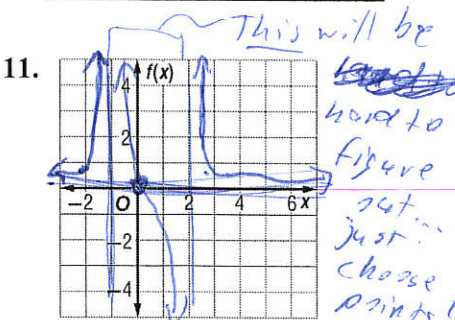
12. If y varies jointly as x and z and $y = 6$ when $x = 4$ and $z = 12$, find y when $x = 24$ and $z = 5$.

12. _____ $y = 5/12$ _____

Handwritten work (scratch):

① $(2x + 3)(x - 3)$
$2x + 3 = 0$
$-3\ -3$
$2x = -3$
$x = -3/2$
$x - 3 = 0$
$+3\ +3$
$x = 3$

② $\dfrac{x^3}{(x + 8)(x - 8)} \cdot \dfrac{x + 8}{x^3}$

③ $\dfrac{3(b^2 + b - 2)}{(b - 5)(b - 1)} \cdot \dfrac{(b + 5)(b - 5)}{6(b + 2)}$
$\dfrac{3(b + 2)(b - 1)(b + 5)(b - 5)}{(b - 5)(b - 1) \cdot 6(b + 2)}$

④ $\dfrac{3m^2 - 75}{6m^2 + 30} \cdot \dfrac{9m^2 + 45m}{4m - 20}$
$\dfrac{3(m + 5)(m - 5)}{2 \cdot 6(m - 5)} \cdot \dfrac{9m(m + 5)}{4(m + 5)}$

⑤ $\dfrac{2}{(x + 2)(x - 2)} - \dfrac{8}{(x - 2)(x + 2)} = \dfrac{2x + 4 - 8}{(x - 2)(x + 2)}$

⑥ $\dfrac{5}{3m - 1} + \dfrac{2}{3m - 1}$

⑧ $(n - 4)(n + 2)\ (n + 6)(n - 4)$

9. $V.A\quad x - 3 = 0\quad x = 3$

10. $\dfrac{(x + 2)(x - 4)}{(x + 2)}$ or hole $\quad x + 2 = 0 \quad x = -2$

11. $x = -2;\ x = 3;$
$\dfrac{1}{(-4)(-1)} \quad \dfrac{6}{(4)}= 1.5$

x	y
0	0
-1	1/4
3	1.5

12. $\dfrac{y}{xz} = \dfrac{6}{(4)(12)} = \dfrac{y}{(24)(5)}$
$20 = 48y$
$y = \dfrac{20}{48} = \dfrac{10}{24} = 5/12$

Chapter 8 Tizzy Quest *(continued)*

(handwritten top right) # of customers / #of households

13. PHOTOGRAPHS A film-developing company noted that in a particular town the number of customers requesting online delivery of their vacation pictures varied directly with the number of households having high-speed Internet access. Currently, 5000 households in the town have high-speed Internet access and 80 customers request online delivery of their photographs. If this trend continues, how many customers should the film-developing company expect to request online delivery when 12,000 households have high-speed Internet access?

(handwritten) $\dfrac{80}{5000} = \dfrac{x}{12000}$ $x = 192$
$5000x = 960000$

13. $x = 192$

14. If y varies inversely as x and $y = 25$ when $x = 6$, find y when $x = 150$.

(handwritten) $xy = (6)(25) = (y)(150)$ $150 = 150y$

14. $y = 1$

15. GASES The volume V of a gas varies inversely as its pressure P. If $V = 80$ cubic centimeters when $P = 2000$ millimeters of mercury, find V when $P = 320$ millimeters of mercury.

(handwritten) $PV = (80)(2000) = V(320)$

15. $V = 500$

For Questions 16 and 17, state whether each equation represents a *direct*, *joint*, *inverse*, or *combined* variation.

16. $\dfrac{n}{10q} = r$, with dependent variable r *(handwritten)* $\dfrac{n}{rq} = 10$

16. *joint*

17. $\dfrac{m}{7n} = 1$, with dependent variable n *(handwritten)* $\dfrac{m}{n} = 7$

(handwritten) $\dfrac{m}{7} = n$

17. *direct*

For Questions 18 and 19, solve each equation or inequality.

18. $x + \dfrac{2x}{x-2} = \dfrac{3x-2}{x-2}$

(handwritten) $x(x-2) + 2x = 3x - 2$
$x^2 - 2x + 2x = 3x - 2$
$x^2 - 3x + 2 = 0$
$(x-1)(x-2) = 0$ $x = 1, \cancel{2}$
extroneous

18. $x = 1$

19. $9 + \dfrac{2}{m} > \dfrac{47}{m}$

(handwritten) $9m + 2 > 47$
$9m > 20$

19. $m > \dfrac{20}{9}$

20. PAINTING Alice can paint a room in 8 hours. Her assistant can paint the same room in 12 hours. How long will it take if the two of them work together?

(handwritten) $LCF = 24x$ $(24)\dfrac{1}{8} + \dfrac{1}{12}(24) = (24)\dfrac{1}{x}$ $3x + 2x = 24$
$5x = 24$

20. $x = \dfrac{24}{5} = 4.8$ hrs.

Bonus Solve $\dfrac{\frac{1}{x+2} + \frac{1}{x-3}}{\frac{1}{x+2} - \frac{1}{x-3}} = 1$.

B: *(smiley face)*