$x + 2$

**11.** Graph $f(x) = \frac{x+3}{(x-2)(x+1)}$ ← FOIL...

As $x \to \infty$,

$f(x) = \frac{x}{x^2} = \frac{1}{x} = 0$

**12.** If $y$ varies jointly as $x$ and $z$ and $y = 6$ when $x = 4$ and $z = 12$, find $y$ when $x = 24$ and $z = 5$.

$\frac{y}{xz} = \frac{6}{(4)(12)} = \frac{y}{(24)(5)}$

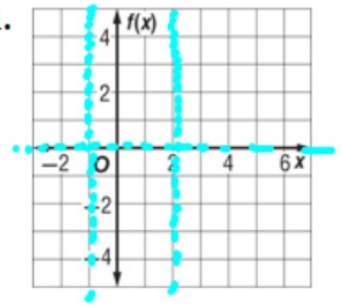
$\frac{1}{48} = \frac{y}{20}$

$48y = 20$

$\frac{48y}{48} = \frac{20}{48}$

$y = \frac{5}{12}$

**11.**




**12.** _____

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?

$\frac{\#\text{ of customers}}{\#\text{ of households}}$

$\frac{80}{5000} = \frac{x}{12{,}000}$

13. _____

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

$y = 1$

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

14. _____

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.

$PV = (80 \times 2000) = P(320)$

15. _____

15. _____

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

16. $\frac{n}{10q} = r$, with dependent variable $r$

$\frac{n}{qr} = 10$

16. joint

17. $\frac{m}{7n} = 1$, with dependent variable $n$

$\frac{m}{n} = 7 = \frac{7}{1} = \frac{14}{2} = \frac{21}{3}$

17. direct

$xy = 12 = 1 \cdot 12 = 2 \cdot 6 = 3 \cdot 4 = 4 \cdot 3 = 6 \cdot 2 = 12 \cdot 1$

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

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

$x(x-2) + 2x = 3x - 2$

$x^2 - 2x + 2x = 3x - 2$

$x^2 - 3x + 2 = 0$

$(x-1)(x-2) = 0$

$x = 1, 2$ ← extraneous

18. $x = 1$

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

19. _____

19

$9m + 27 > 47$

$-2 \quad -2$

$\frac{9m}{9} > \frac{45}{9}$

$m > 5$

18. _____

**19.** $9 + \frac{2}{m} > \frac{47}{m}$ · m

19. _____

**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?

20. _____

20

$\frac{1}{8} + \frac{1}{12} = \frac{1}{x}$ · 24x

$3x + 2x = 24$

$5x = 24$

$x = \frac{24}{5} = 4.8$ hours

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

B: _____