

$$\textcircled{1} \text{ Average delivery rate} = \frac{\text{total \# of packages delivered}}{\text{total time}}$$

WS Chapter 5,  
Part 1.5  
REVIEW

$$= \frac{20}{\frac{10}{2} + \frac{10}{4}} = \frac{20}{\frac{15}{2}} = 20 \cdot \frac{2}{15} = \boxed{2\frac{2}{3} \text{ packages/hour}}$$

$\textcircled{2}$  R. <sup>Ted's</sup> rate when running

$$\frac{2}{\frac{1}{4} + \frac{1}{r}} = 6 \rightarrow \frac{2}{\frac{r+4}{4r}} = 6 \rightarrow \frac{2 \cdot 4r}{r+4} = 6$$

$$2 \cdot \frac{4r}{r+4} = 6 \rightarrow \frac{8r}{r+4} = 6 \rightarrow 8r = 6r + 24$$

$$2r = 24$$

$$r = 12 \text{ mph}$$

$$\textcircled{3} \frac{W}{L} = \frac{L}{L+W}$$

$$\frac{W}{24} = \frac{24}{24+W}$$

$$W^2 + 24W = 576$$

$$W^2 + 24W - 576 = 0$$

$$W = \frac{-24 \pm \sqrt{24^2 - 4(1)(-576)}}{2}$$

$$W = \frac{-24 \pm \sqrt{2880}}{2}$$

$$W = \frac{-24 \pm 24\sqrt{5}}{2} = -12 \pm 12\sqrt{5}$$

$$W \approx \boxed{14.83 \text{ inches}} \text{ or } -38.83$$

TEAM A

TEAM B

$$\textcircled{4} \frac{1}{x}(8.5) + \frac{1}{x+3}(8.5) = 1$$

$$\frac{8.5(x+3)}{(x+3)x} + \frac{8.5x}{x(x+3)} = \frac{1 \cdot x(x+3)}{x(x+3)}$$

$$8.5x + 25.5 + 8.5x = x^2 + 3x$$

Team B take  
would take  
 $\approx 18.63$  hours alone

$$x^2 - 14x - 25.5 = 0$$

$$x = \frac{14 \pm \sqrt{14^2 - 4(1)(-25.5)}}{2}$$

$$x = \frac{14 \pm \sqrt{298}}{2} \approx 15.63 \text{ hours} \text{ or } -3.26$$

⑤ J: # of hours jessie would take to mow lawn by herself.

$$\frac{1}{4}(2.5) + \frac{1}{J}(2.5) = 1$$

$$2.5J + 10 = 4J$$

$$10 = 1.5J$$

$$J = 6\frac{2}{3} \text{ hours}$$

Jessie would take 6 hours 40 minutes to mow lawn

$$\frac{2.5J}{4J} + \frac{4(2.5)}{4(J)} = \frac{1(4J)}{4J}$$

⑥ N: # of minutes it would take Norton to weed garden by himself

$$\frac{1}{30}(20) + \frac{1}{N}(20) = 1$$

$$2N + 60 = 3N$$

$$\boxed{N = 60 \text{ minutes}}$$

$$\frac{2N}{3N} + \frac{3(20)}{3(N)} = \frac{1(3N)}{3N}$$

⑦ c: speed of current

$$\frac{35^{(15+c)}}{(15+c)(15-c)} + \frac{35^{(15-c)}}{(15+c)(15-c)} = 4.8(15+c)(15-c)$$

$$525 + 35c + 525 - 35c = 1080 - 4.8c^2$$

$$-4.8c^2 = -30$$

$$c^2 = 6.25$$

$$c = \boxed{2.5 \text{ km/h}}$$

⑧ c: average speed of current

$$\frac{60^{(8+c)}}{(8+c)(8-c)} + \frac{60^{(8-c)}}{(8-c)(8+c)} = 16.5(8+c)(8-c)$$

$$480 - 60c + 480 + 60c = 1056 - 16.5c^2$$

$$16.5c^2 = 96$$

$$c = \sqrt{2.41} \text{ mph}$$

9) A: # of hours it would take Apprentice if working alone

$$\frac{1}{2}(1.5) + \frac{1}{A}(1.5) = 1$$

$$\frac{1.5/A}{(2)A} + \frac{2(1.5)}{2(A)} = \frac{1(2A)}{2A}$$

$$1.5A + 3 = 2A$$

$$3 = 0.5A$$

$$A = \text{6 hours}$$

10) S: # of minutes the job will take small copier alone

$$\frac{1}{50}(30) + \frac{1}{S}(30) = 1$$

$$\frac{30}{50} + \frac{(30)S}{50} = 1 \frac{(50)}{(50)}$$

$$30 + 150 = 50S$$

$$150 = 20S$$

$$S = \text{75 minutes}$$

$$\textcircled{11} \quad \frac{188+h}{643+h} = \frac{191}{614}$$

$$115432 + 614h = 122813 + 191h$$

$$\frac{423h}{423} = \frac{7381}{423}$$

$$h \approx 17.45 \rightarrow \text{18 hits}$$

12) Answers may vary

$$f(x) = \frac{1}{x+3} + 2$$

13) Answers may vary

$$f(x) = \frac{1}{3x-2}$$

14) Answers may vary

$$f(x) = \frac{2(x-1)(x-2)}{(x-3)(x-2)}$$

$$\text{OR } f(x) = \frac{2x^2 - 6x + 4}{x^2 - 5x + 6}$$

$$\frac{2(2+c)}{-1} = -2$$

$$2(2+c) = 2$$

$$2+c = 1$$

$$c = -1$$

$$(5) \quad g(x) = \frac{1}{x+5} + 7$$

$$\text{V.A. } x = -5$$

$$\text{D } x \neq -5$$

$$\text{H.A. } y = 7$$

$$\text{R: } y \neq 7$$

$$(6) \quad \text{VA: } x = 9, \text{ D } x \neq 9$$

$$\text{HA: } y = -1/4 \quad \text{R: } y \neq -1/4$$

$$(17) \quad \text{VA: } x = -2/3, \text{ D: } x \neq -2/3$$

$$\text{HA: } y = -12, \text{ R: } y \neq -12$$

$$(18) \quad f(x) = \frac{2(x+3)(x-3)}{(x+5)(x-5)}$$

$$\text{Zeros: } (-3, 0), (3, 0)$$

$$\text{VA: } x = -5, x = 5$$

$$\text{HA: } y = 2$$

No holes

$$(19) \quad f(x) = \frac{(x+3)(x-1)}{x+3}$$

$$\text{Zeros: } (1, 0)$$

$$\text{VA: none}$$

$$\text{HA: none}$$

$$\text{hole: } (-3, -4)$$

$$(20) \quad f(x) = \frac{(x+4)(x+1)}{(x+4)(x-3)}$$

$$\text{Zeros: } (-1, 0)$$

$$\text{VA: } x = 3$$

$$\text{HA: } y = 1$$

$$\text{hole: } (-4, 3/7)$$

\* graphs are on separate page

$$(25) \quad \frac{5x-8}{x-5} \geq 2$$

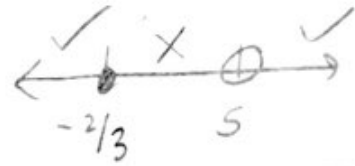
exclusion:  $x \neq 5$   
solution,  $x = -2/3$

$$\frac{5x-8}{x-5} = 2$$

$$5x-8 = 2x-10$$

$$3x = -2$$

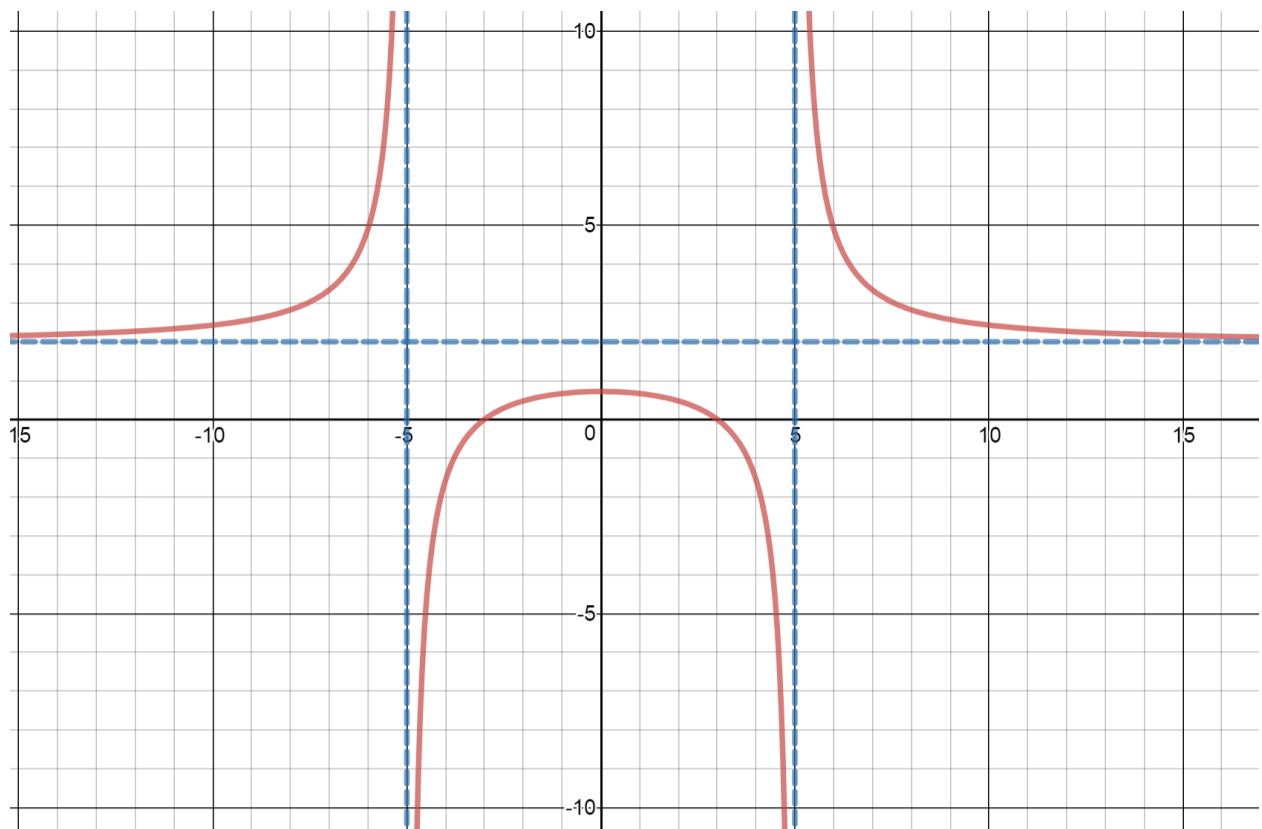
$$x = -2/3$$



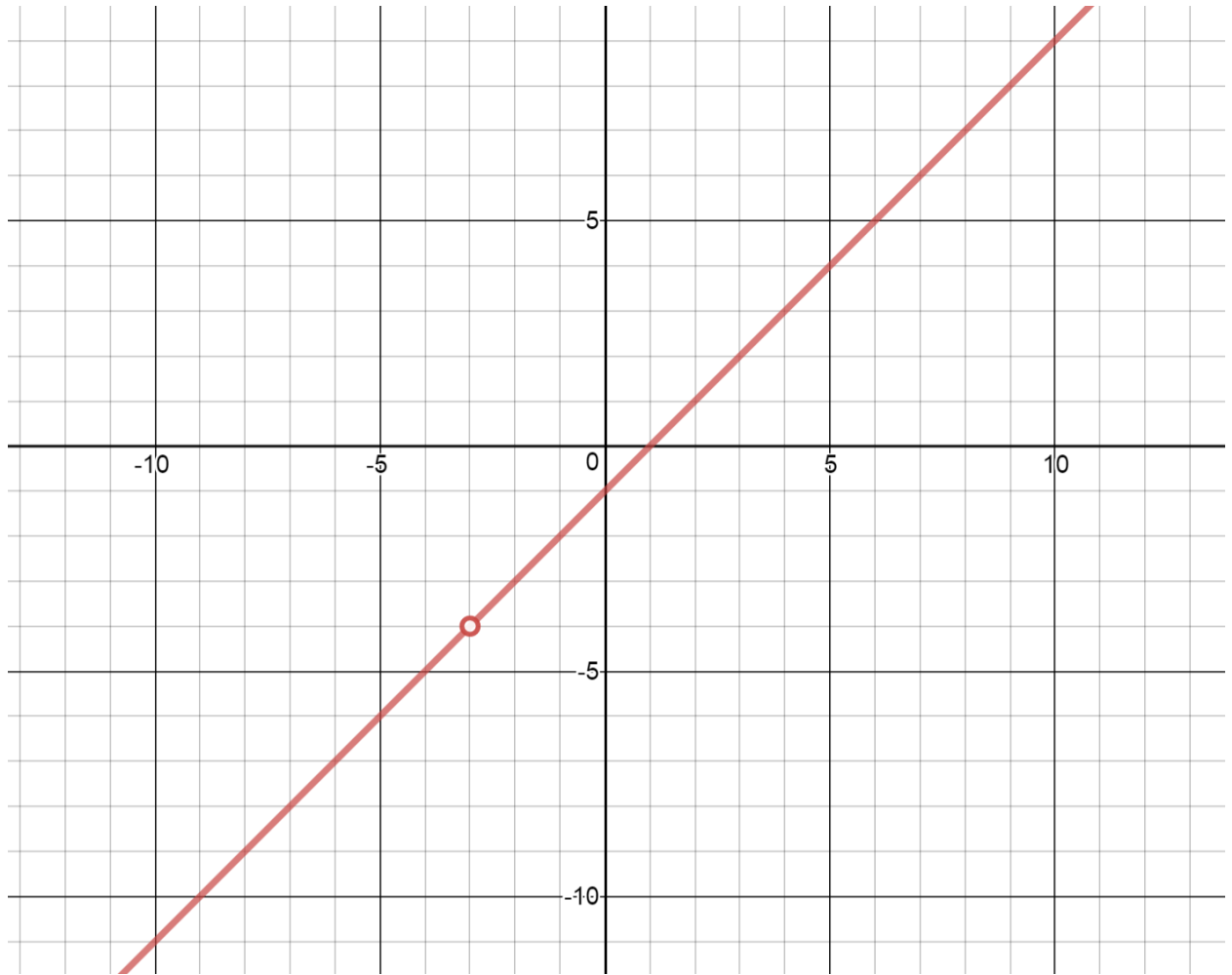
$$(-\infty, -2/3] \cup (5, \infty)$$

GRAPHS – TEST REVIEW CHAPTER 5, Part 1.5

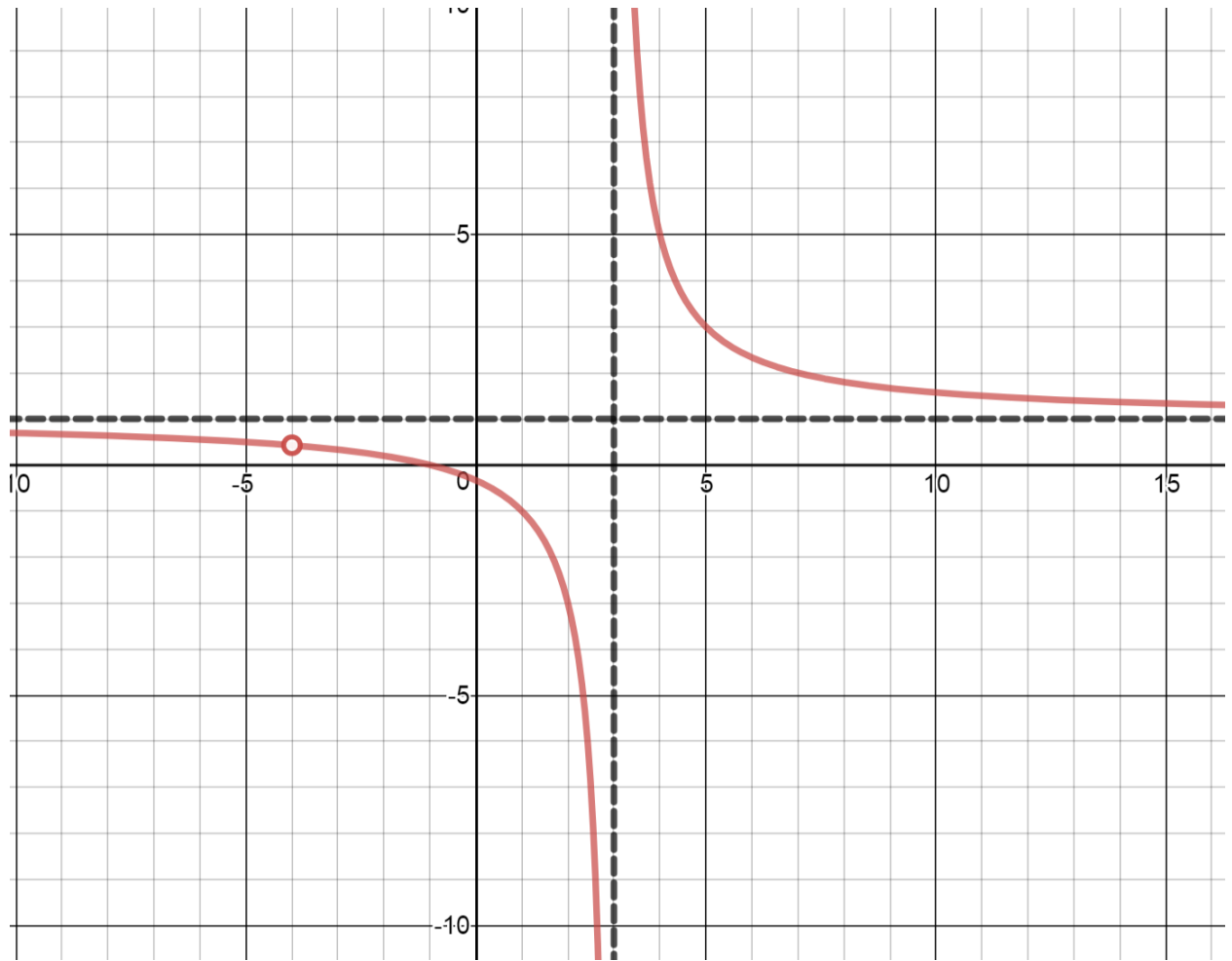
18.



19.



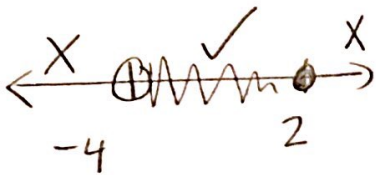
20.





(21)  $\frac{x-2}{x+4} \leq 0$

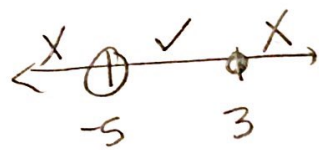
exclusions:  $x \neq -4$   
 solution:  $x = 2$



$[-4, 2]$

(22)  $\frac{3-x}{x+5} \geq 0$

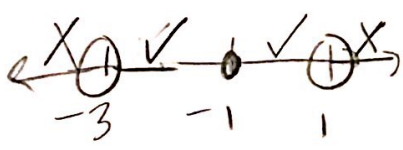
exclusions  $x \neq -5$   
 solution:  $x = 3$



$[-5, 3]$

(23)  $\frac{(x+1)^2}{(x+3)(x-1)} \leq 0$

solution:  $x = -1$   
 exclusions:  $-3, 1$



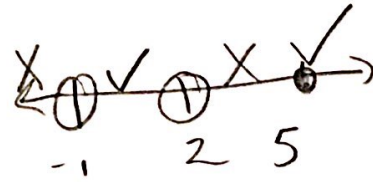
$(-3, 1)$

(24)  $\frac{2}{x+1} \geq \frac{1}{x-2}$

exclusions:  $x \neq 2, -1$   
 solution:  $x = 5$

$\frac{2}{x+1} = \frac{1}{x-2}$

$2x - 4 = x + 1$   
 $x = 5$



$(-1, 2) \cup [5, \infty)$