Pre Calculus 11

Sect 6.5b Applications of R.F.

Name _____ Date _____

1. Michael can mow the lawn in half an hour, and Alex can mow it in three-quarters of an hour. Suppose Michael spends 20 minutes on the job, and then Alex finishes it. How long does Alex have to work?

2. Arthur and Bradley can complete a job in 12 minutes if they work together. By himself, Bradley would take 36 minutes to do the same job. How long would Arther take working alone?

3. Together, Dan and Laura can write their wedding invitations in 9 hours. It would take Laura 15 hours to do the job by herself. How long would it take Dan to do the job?

4. Floyd can collate a set of papers in 45 minutes. Pheobe can do it in 50 minutes. But Anita is the fastest of all; she can do the collation in 40 minutes. How long would it take all three, working together, to do the job? (Approximate your answer to the nearest minute.)

5. Grace and Yee can take inventory of their store in $1\frac{3}{4}$ hours, if they work together. It takes Yee half as much time as Grace, if they do the work individually. How long does it take Yee (to the nearest minute)?

6. Working together, Fred and Ned can assemble 500 gadgets in $3\frac{1}{2}$ hours. Working indvidually, it takes Fred two-thirds as much time as Ned to complete the job. How long does it take Ned (in hours and minutes)?

7. Together, Louise and Stacy can do a job in 1 hour and 12 minutes. Individually, Louise takes an hour longer than Stacy. How long does it take Stacy to complete the job by herself?

8. Working together, two pipes can fill the tank in 2 hours and 6 minutes. Working alone, the larger pipe fills the tank in 4 hours less time than the smaller one. How long does the larger pipe take?

9. Each week, Angela flies her small plane 500 km from Lethbridge to Moose Jaw. After a brief stopover, she returns to Lethbridge. On both trips, the air speed is 180 km/h. On the flight out there is a constant 20 km/h tail wind, and on the return trip a constant head wind of the same speed. Calculate the time needed for a round trip.

10. A tour boat's top speed is 40 km/h on calm water. The boat leaves its dock and goes straight upstream 15 km to see Niagara Falls, then returns straight downstream to its dock. On both trips it makes full speed. Suppose the Niagara River's current is a steady 25 km/h in that section of the river. Calculate the time needed (in hours rounded to two decimal places) for the tour.

11. A salmon can has an approximate volume of $251.33\,\text{cm}^3$ and a base radius of 4 cm. The company plans to redesign the can with a smaller base. The new can will have the same volume as the original can. What is the increase in height if the base is decreased to radius 3.5 cm? Make your answer correct to two decimal places.

12. The world's largest nickel mine in Sudbury, Ontario, displays a five cent piece with a radius of 4.6 m cast from $55\,\text{m}^3$ of stainless steel. Suppose the company were to melt and recast all the metal into a five cent coin with a 3 m radius. How much wider would the edge of the new coin be? Make your answer correct to two decimal places.

13. On average, Sarah can travel four times as fast on cross-country skis as she can with snowshoes. To travel 24 km, she needs 6 h more if she is snowshoeing than if she is skiing. What is her average speed on crosscountry skis? Round your answer to two decimal places.

14. Jerry can row a boat at an average speed that is eight times as fast as his average swimming speed. It takes him 80 minutes more to swim 4 laps in a lake than to row 4 laps. How fast is his average swimming speed in laps per minute? Round your answer to two decimal places.

15. The average speed of a car is three times as fast as the average speed of a cyclist. To travel 225 km, the cyclist requires 5 h more than the car. Determine the average speeds of the cyclist and the car.

16. An airplane travels between two cities that are 350 miles apart. One day the airplane leaves 15 minutes behind schedule. In order to arrive at its destination on time, the airplane flies 25 mph faster than usual. What is the airplane's usual speed?

17. A garbage truck drives 56 km to its destination, the city dump. If the rate returning is twice the rate going, and the travel time for the round-trip is 2 hours, find the rate returning.

18. Luke cycled 36 miles to the beach. On the way back, he cycled 6 mph slower than on the way out. If the round-trip took 5 hours, what was his rate returning from the beach?

19. An airplane flies 900 km with a tailwind and then returns the same distance against the wind. The round-trip lasts 7 hours. If the airplane's speed in still air is 280 km/hr, what is the speed of the wind?

20. A helicopter flew 15 miles against a 25 mph headwind. Then it flew back with the wind at its tail. The round-trip lasted 27 minutes. Find the helicopter's speed in still air.

21. Maria swam one kilometer up a river and the same distance back. The workout lasted 40 minutes. If Maria swims 4 km/hr in still water, what was the speed of river current?

22. Eugene can row 10 km/hr in still water. One day it took him 4 hours longer to go a certain distance upstream than the same distance downstream. If the speed of the current was 5 km/hr, how far upstream did he go?

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Answer List

1.	15 min	2.	18 min	3.	$22\frac{1}{2}$ hrs
4.	15 min	5.	79 min	6.	8 hr 45 min
7.	2 hrs	8.	3 hrs	9.	$5\frac{5}{8}$ h
10.	1.23 h	11.	1.53 cm	12.	1.12 m
13.	12 km/h	14.	0.04 laps/min	15.	30 km/h; 90 km/h
16.	175 mph	17.	84 kph	18.	12 mph
19.	80 km/hr	20.	75 mph	21.	2 km/hr
22.	30 km				

Catalog List

1.	ALG LN 1	2.	ALG LN 5	3.	ALG LN 9
4.	ALG LN 23	5.	ALG LN 31	6.	ALG LN 32
7.	ALG LN 39	8.	ALG LN 40	9.	AW1 GG 5
10.	AW1 GG 7	11.	AW1 GG 13	12.	AW1 GG 15
13.	AW1 GG 17	14.	AW1 GG 19	15.	AW1 GG 21
16.	ALG LN 67	17.	ALG LN 74	18.	ALG LN 76
19.	ALG LN 85	20.	ALG LN 87	21.	ALG LN 90
22.	ALG LN 91				