

Build Your Skills

1. a) $40 \text{ h} \times \$23.68 = \$947.20/\text{week}$

b) Weeks worked and paid holidays are paid at the same rate.

$$49 \text{ weeks} + 3 \text{ weeks} = 52 \text{ weeks}$$

$$52 \times \$947.20 = \$49\,254.40/\text{year}$$

Students may also calculate the rate for each of 49 and 3 weeks (\$46 412.80 and \$2841.60, respectively) and add the two amounts to find the same solution.

2. Biweekly payments occur every second week, such as every other Friday. Semi-monthly payments occur twice a month, such as the fifteenth of the month and the last day of the month. The total number of biweekly payments in a year is 26. The total number of semi-monthly payments in a year is 24. So, the advantage of being paid biweekly is that you would be paid more often. However, if you're paid semi-monthly, your payments will be larger.

3. Students may tackle this in different ways and arrive at slightly different answers.

Method 1

First, calculate how many hours Luc works in a month. Students may be familiar with the idea that a month has about 4 weeks. However, that is not accurate. This discussion can be a great learning opportunity for students. You might begin by asking students if there are really only 4 weeks in a month and 52 weeks in a year. Encourage students to share strategies for calculating weeks in a month and in a year. Have the students divide 52 weeks by 12 months to find that, on average, a month contains 4.33 weeks. See p. 84 for an additional discussion of calculating weeks in a month.

$$12 \text{ h/week} \times 4.33 \text{ weeks/month} = 51.96 \text{ h/month}$$

Then, divide Luc's monthly pay by his monthly hours.

$$\$534.12/\text{month} \div 51.96 \text{ h/month} = \$10.28/\text{h}$$

Luc earns about \$10.28/h.

Method 2

Students may also approach this problem by calculating the average number of hours Luc worked in one month by multiplying his weekly hours by 52 and dividing by 12 to find the average number of hours he worked in a year.

$$12 \text{ h} \times 52 = 624 \text{ h/year}$$

$$624 \div 12 = 52 \text{ h/month}$$

Now, divide Luc's monthly pay by the number of hours he worked in a month.

$$\$534.12/\text{month} \div 52 \text{ h/month} = \$10.28/\text{h}$$

Luc earns about \$10.28/h.

4. Students would want to consider how many lawns they can cut in an hour. Being paid hourly would only be beneficial if they could cut more than four lawns in an hour and if they could maintain that work pace throughout the day.

5. Multiply Arielle's hourly wage by her hours a week.

$$\$10.20/\text{h} \times 12 \text{ h/week} = \$122.40/\text{week}$$

Remind the students that, on average, a month contains 4.33 weeks/month. Multiply her weekly wage by 4.33 weeks/month.

$\$122.40/\text{week} \times 4.33 \text{ weeks/month} = \529.992 , rounded to the nearest dollar to $\$530.00/\text{month}$

Arielle's average monthly wage is $\$530.00$.

To calculate if Arielle's monthly earnings would increase by more than $\$100.00$, find the difference between her old and new hourly wage.

$$\$12.50 - \$10.20 = \$2.30$$

Multiply her increase by her monthly hours.

$$\$2.30/\text{h} \times 12 \text{ h/week} \times 4.33 \text{ weeks/month} = \$119.51/\text{month}$$

Arielle's earnings would increase by $\$119.51$ a month.

6. Set up a proportion, converting 150% to the decimal 1.5.

$$\frac{\$45.00}{1.5} = \frac{x}{1}$$

Multiply each side by the common denominator, 1.5.

$$(1.5) \frac{\$45.00}{1.5} = \frac{x}{1} (1.5)$$

$$\$45.00 = 1.5x$$

Simplify.

$$\frac{\$45.00}{1.5} = x$$

$$\$30.00 = x$$

Brandon's regular hourly rate is $\$30.00$.

7. a) **Method 1**

Convert 3.4% to the decimal 0.034. Multiply the original salary by 0.034 to find the amount of the increase.

$$\$29\,535.00 \times 0.034 = \$1004.19$$

Add the raise to the original salary.

$$\$29\,535.00 + \$1004.19 = \$30\,539.19$$

Method 2

Calculate the new salary by multiplying the original salary by 1.034 (100% + 3.4%).

$$\$29\,535.00 \times 1.034 = \$30\,539.19$$

b) Calculate the salary after the second raise.

$$\$30\,539.19 \times 1.028 = \$31\,394.29$$

Calculate the salary after the third raise.

$$\$31\,394.29 \times 1.032 = \$32\,398.91$$

Check that students understand that each yearly raise is calculated based on the previous year's salary, not the initial salary.

8. **Nov. 15**

a) 3 h 2 min

$$\text{b) } \frac{2}{60} = \frac{1}{30} = 0.03, \text{ rounded}$$

3.03 h, rounded

Nov. 16

a) 5 h 4 min

$$\text{b) } \frac{4}{60} = \frac{2}{30} = 0.07, \text{ rounded}$$

5.07 h, rounded

Nov. 17

a) 3 h 2 min

b) $\frac{2}{60} = \frac{1}{30} = 0.03$, rounded

3.03 h, rounded

Nov. 18

a) 5 h 31 min

b) $\frac{31}{60} = 0.52$

5.52 h

Nov. 19

a) 3 h 28 min

b) $\frac{28}{60} = 0.47$

3.47 h

c) Calculate total hours worked rounded to the nearest quarter hour.

$$x = 3 + 5 + 3 + 5.5 + 3.5$$

$$x = 20$$

Multiply hours worked by hourly rate.

$$x = 20 \times \$9.90 = \$198.00$$

d) It is preferable to start and end at the specified times because you don't get paid more for starting a few minutes early or leaving a few minutes late.

9. a) Errors on Franco's pay statement:

- The pay dates are incorrect. The end date is earlier than the begin date, and the end date year is 2110 instead of 2011.
- His total hours should be 32.5.
- Franco's gross earnings should be \$323.38.

b) Errors on Christine's pay statement:

- Two different pay rates are listed.
- Christine's gross earnings should be \$236.18, assuming her correct hourly wage is \$10.05.

c) Answers will vary. Students may suggest that they would inform their supervisor or payroll clerk of the error on the pay slip. They may also suggest keeping their own records of the hours they work to check against the pay slip.

Extend Your Thinking

10. a) Answers will vary. Some factors to consider include pay, length of time the jobs last, cost and time involved in commuting, additional perks or benefits each job provides, and how interested you are in each kind of work.

b) Students would need to know how many hours a week they would be working at the community centre job. They might also want to consider the cost of transportation such as bus fare or gas.

c) The house-painting job may require some overtime if a particular job has a deadline that must be met because of weather.

d) Students may suggest that overtime would be appealing if they wanted to earn extra money; if it might help them get a promotion or pay raise; or if they could get time off for working extra hours. They might not want to work overtime if they have other commitments; they don't like the job; or if they don't need the additional money.