**Calculating Interest Earned on Accounts:**

1. Jodie received $530 from family members for her birthday. She plans to buy a car in the near future, and she is putting all of the birthday money towards the purchase. On June 1, she opened a savings account and deposited the $530. The account pays an annual interest rate of 0.50% compounded daily.

$r = 0.5\% \div 100 = 0.005$

(a) How much interest will Jodie earn in one month?

$i = \frac{0.005}{365}$ $n = 30$

$A = P(1+i)^n$

$= 530\left(1+\frac{0.005}{365}\right)^{30}$

$A = 530.22$

$I = 530.22 - 530.00$

$= 0.22$

The interest earned is $0.22.

(b) How much interest will Jodie earn in six months? (June – November)

$i = \frac{0.005}{365}$ $n = 30+31+31+30+31+30$

$= 183$

$A = 530\left(1+\frac{0.05}{365}\right)^{183}$

$= 531.33$

$I = 531.33 - 530.00$

$= 1.33$

The interest earned is $1.33.

2. Determine the future value of each amount deposited into a daily interest savings account.

(a) $400 for one year at 2.5% per year

n in days

$A = 400\left(1+\frac{0.025}{365}\right)^{365}$

$= 410.13$

Future value is $410.13

(b) $2500 for one week at 1% per year

N = 365

n

$A = 2500\left(1+\frac{0.01}{365}\right)^{7}$

$= 2500.48$

Future value is $2500.48

**Calculating Services Charges:**

3. Hun's bank charges $5.95 for up to 10 transactions per month plus 75¢ for each additional transaction. In November, he made eight transactions; in December, he made 23 transactions. Determine the service charges deducted from Hun's account balance each month.

| **Service Charge** = **Monthly Fee** + **Cost of Extra Transactions** (Number of extra transactions × Fee) |
|---|

In November: # of transactions = 8 # of extra transactions = 0

Service Charge = 5.95 + 0
= 5.95

In December: # of transactions = 23 # of extra transactions = 13

Service Charge = 5.95 + 13 X 0.75
= 15.7

P r = 0.0325

4. Sara has $600 in a savings account. This account pays 3.25% interest per year, compounded daily. Her financial institution does not charge a fee for transactions on her account.

N = 365 I = ?

(a) How much interest will Sara earn in the month of May? → 31 days in May

$$A = 600\left(1 + \frac{0.0325}{365}\right)^{31}$$
$$= 601.66$$

$I = 601.66 - 600$
$= 1.66$

She will earn $1.66 in interest.

(b) How much interest will she earn in one year? n = 365

$$A = 600\left(1 + \frac{0.0325}{365}\right)^{365}$$
$$= 619.82$$

$I = 619.82 - 600$
$= 19.82$

She will earn $19.82 in interest.

For Questions 5 and 6, refer to the following table.

| Banking Option 1 | Banking Option 2 | Banking Option 3 |
|---|---|---|
| $9.75 per month for the first 10 transactions; $1.25 for each additional transaction | $14.75 per month for the first 25 transactions; $1.25 for each additional transaction | $24.95 per month for an unlimited number of transactions |

1 extra

$\frac{30}{7} = 4.3$

5. In a typical month, Jack uses an automated bank machine (ABM) twice a week to withdraw cash from his chequing account. Each month, his car payment and his car insurance premium are automatically deducted from his account. 2

(a) How many transactions does Jack make in a typical month?

There are actually 4 weeks plus 2 or 3 days in a month. If Jack withdraw twice in a week, he would withdraw 9 times in a month. 8 times for the first two weeks then an extra time for the first half of the following week.

Total transactions = 2 x 4 + 1 + 1 + 1 = 11 transactions in a typical week

**Jack makes 11 transactions in a typical month.**

(b) Which banking option might be best for Jack? Explain.

Jack should choose option 1 because it is the cheapest and he does not make a lot of transactions to make it worthwhile to take option 2 and option 3.

(c) Calculate the total cost and the cost per transaction for each option.

① $9.75 + 1 \times 1.25$ ② $14.75 ③ $24.95

$= \$11$

Total cost = $11
Cost per transaction:
$11÷11
= $1/transaction

Total cost = $14.75
Cost per transaction:
$14.75÷11
= $1.34/transaction

Total cost = $24.95
Cost per transaction:
$24.95÷11
= $2.26/transaction

6. Alex is paid bi-weekly by cheque. He usually uses his debit card two or three times per week.

(a) Which banking option might be best for Alex? Explain.

(b) On October 1, when he went online to do his banking, Alex noticed bank charge debits from his account by his bank for $9.75 and $7.50. Which banking option does Alex currently use? Explain.

(c) How many transactions were made in Alex's account last month? Explain.

(d) Calculate the total cost and the cost per transaction for Alex last month.