1. You deposit $2000 in the bank. Find the simple interest earned if the interest rate is 3% and you leave it in the bank for 10 months.

\[ I = Prt \]

\[ 2000 \times 0.03 \times \left( \frac{10}{12} \right) = \$50 \]

2. Calculate the total in your bank account at the end of a year if you deposit $5000 at an interest rate of 2.5%, compounded annually.

\[ A = P\left(1 + \frac{r}{n}\right)^{nt} \]

\[ 5000 \left(1 + \frac{0.25}{1}\right)^1 = \$5125 \]

3. Calculate the total in your bank account at the end of a year if you deposit $5000 at an interest rate of 2.5%, compounded semi-annually. \((n = 2)\)

\[ 5000 \left(1 + \frac{0.25}{2}\right)^2 = \$5125.78 \]

4. A friend said they put $10,000 in the bank and one year later had earned $900 in interest.

a) Calculate the interest rate required to earn $900 interest.

\[ r = \frac{I}{P + I} \]

\[ \frac{900}{10000 \times 1} = 0.09 \rightarrow \times 100 = 9\% \]

b) Is it possible to get this kind of interest rate? Comment.

No, not now
Much too high

5. You invest $4,000 into a credit union for five years. The interest rate is 3.75%, compounded monthly. Calculate the interest earned.

\[ t = 5 \]

\[ n = 12 \]

\[ nt = 60 \]

\[ 4000 \left(1 + \frac{0.375}{12}\right)^{60} = \$4823.51 \]
6. The same $4,000 is deposited into an account earning the same interest rate (3.75%), compounded daily! Calculate the interest earned after 5 years.

\[
4000 \left(1 + \frac{0.0375}{365}\right)^{1825} = 4824.87
\]

7. You inherit $5,000,000 and invest it at an interest rate of 2%. How many years will it take you to double your investment?

\[
\text{Rule of 72: } \frac{72}{2} = 36 \text{ years.}
\]

8. When Sandra was born, her parents deposited $2000 in the bank. Sandra has just turned 16 years old.

a) Using the simple interest formula \(I = Prt\) and assuming the interest rate was 2%, approximately how much money will be in the bank account now?

\[
2000 \times 0.02 \times 16 = 640 \text{ interest}
\]

Total is $2640

b) Will the actual amount of interest added to Sandra’s account be more, less, or equal to the amount calculated in a)? Why?

more because of compounding every year.

9. Abe wants to buy a car when he turns 18. His bank is offering 2.75% interest, compounded annually.

a) If Abe invests $1000, how long will it take him to have a balance of $3000 in his bank account? Use the simple interest formula.

\[
t = \frac{I}{Pr} = \frac{2000}{(1000 \times 0.0275)} = 72.7 \text{ years}
\]
b) If Abe is 16 now, how old will he be when he gets his car?

\[16 + 7 \times 3 = 89 \text{ years old}\]

c) Abe needs some advice. How can he increase his $1000 to $3000 in two years?

Add to his investment regularly.
Ex: put another $100 in every month.

10. Why is the stock market considered a high risk investment and a savings account a low risk investment?

- Stock market — risk of losing money is high.
- Savings — guaranteed so no risk of loss.

On July 1, Skip makes a purchase of $1,100 on his mastercard. The purchase appears on his monthly statement issued July 12. Skip does not pay for the purchase by the due date indicated on the July statement. His next monthly statement is issued August 12. His credit card charges him an annual interest rate of 19.49%. Calculate the interest added to his August statement for the purchase. Use a calendar to count the number of days.

\[
\begin{array}{|c|c|c|c|c|c|c|}
\hline
\text{S} & \text{M} & \text{T} & \text{W} & \text{T} & \text{F} & \text{S} \\
\hline
\text{July} & 1 & 2 & 3 & 4 & 5 & 6 & 7 \\
8 & 9 & 10 & 11 & 12 & 13 & 14 & \\
15 & 16 & 17 & 18 & 19 & 20 & 21 & \\
22 & 23 & 24 & 25 & 26 & 27 & 28 & \\
29 & 30 & 31 & \text{Aug} & 1 & 2 & 3 & 4 \\
5 & 6 & 7 & 8 & 9 & 10 & 11 & \\
12 & \\
\hline
\end{array}
\]

43 days

\[
1100 \times 0.1949 \times \frac{43}{365} = \$25.26
\]
12. Sally wants to borrow $6,700. A bank is offering Sally two loan options.

Option 1: A 3-year loan has an annual interest rate of 6.75%.
Option 2: A 6-year loan has an annual interest rate of 6.75%.

a) Calculate Sally's monthly loan payment if she chooses the 3-year loan with a rate of 6.75%. Use a loan payment table.

\[
\frac{6700}{1000} \times 30.76 = \$206.09
\]

b) Calculate Sally's monthly loan payment if she chooses the 6-year loan with a rate of 6.75%. Use a loan payment table.

\[
\frac{6700}{1000} \times 16.93 = \$113.43
\]

c) Compare the total interest paid with the 3-year loan and the 6-year loan. Which loan will cost her more in interest? How much?

3 yr \ 206.09 \times 12 \times 3
   = \$7419.24 \text{ total}
   - 6700 \text{ loan amt}
   \$719.24 \text{ interest}

6 yr \ 113.43 \times 12 \times 6
   = \$7166.96 \text{ total}
   - 6700 \text{ loan amt}
   \$1466.96 \text{ interest}

13. When selecting a credit card, what three things would you keep in mind? Describe in enough detail to show you understand.

- 0% rate vs 19.99% me, Visa
- 29.99% store
- Points get prizes, etc., with use.
14. Joyce’s monthly credit card statement has a previous balance of $1238.56. The statement indicates that Joyce made a payment of $1000 during the month and purchased more goods totaling $989.78. Assume her interest charges for the month are $43.60. Joyce’s minimum monthly payment corresponds to at least 5% of her ending balance or $10, whichever is greater.

a) Calculate Joyce’s new balance.

\[ \text{New Balance} = 1238.56 - 1000 + 989.78 + 43.60 = 1271.94 \]

b) Calculate Joyce’s minimum monthly payment.

\[ 1271.94 \times 0.05 = 63.60 > 10 \]

15. Complete the following chart that compares several different sources of credit. Jot down the approximate interest rate and when it makes sense to use that source of credit.

<table>
<thead>
<tr>
<th></th>
<th>Bank or Credit Union</th>
<th>Credit Card</th>
<th>In-Store Credit (ex. Buy now, pay later)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest Rate</td>
<td>5% - 8%</td>
<td>19.99%</td>
<td>29.99%</td>
</tr>
<tr>
<td>Makes sense when...</td>
<td>getting a vehicle loan.</td>
<td>if you pay your balance owing every month</td>
<td>you need to pay balance right away because it is so high.</td>
</tr>
</tbody>
</table>
16. You are purchasing a Panasonic TV and have two payment options: Cash or Installment Plan.

a) Complete the tables below to compare paying cash to paying in installments:

<table>
<thead>
<tr>
<th>Sticker Price</th>
<th>PST (8%)</th>
<th>GST(5%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1659</td>
<td>132.72</td>
<td>82.95</td>
<td>$1874.67</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Money Down</th>
<th>Fee per month</th>
<th>Number of months</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>$200</td>
<td>$150</td>
<td>12</td>
<td>$2000.00</td>
</tr>
</tbody>
</table>

b) What is the carrying charge (extra) when paying by installment?

\[ 2000 - 1874.67 = 125.33 \]

b) Calculate the percent interest rate you are paying if you "borrow" money from the store instead of paying cash.

\[ I = 125.33 \]
\[ P = 1874.67 \]
\[ Y = \frac{I}{P + \left( \frac{125.33}{1874.67 \times 1} \right) \times 100} = 6.69 \% \]

d) When does it make sense to pay for something in installments? (1 mark)

This rate is okay (similar to bank)

Need us want

\[ \text{Never for this because typically the rates are higher than a credit card.} \]
17. Merle has just purchased a treadmill for his wife at Sonic Sports. The promotional offer is as follows:

Buy now, pay later! An administration fee of $175 is payable now when you take the treadmill home. The balance owing of $1299 is due two years from now.

a) How much “interest” is Merle getting on this “loan”?

\[ r = \frac{I}{P \times t} = \frac{175}{1299 \times 2} \times 100 = 6.7\% \]

b) What interest rate is Merle getting on this “loan”?

c) Merle can’t pay the balance two years from now and the store says he can put the balance on their store credit card. The balance is $1299 but the added interest at 29.99% from two years ago! How much interest was added to his balance?

\[ t = 2 \times \frac{365}{365} = 2 \text{ years} \]

The store calculates interest from the purchase date.

\[ A = 1299 \left(1 + \frac{0.2999}{365}\right)^{730} = \$2365.88 \text{ owing}. \]

\[ 1299 - \$1066.88 \text{ interest}. \]

18. Jillian receives her credit card statement in the mail. Her balance is $2016.84. Her minimum payment due is $61.00.

a) Calculate Jillian’s new balance after making the minimum payment.

\[ 2016.84 - 61.00 = \$1955.84 \]

b) What percent of Jillian’s balance ($2016.84) is the minimum payment ($61.00)?

\[ \frac{61.00}{2016.84} = 3.02\% \]

-7-
c) Jillian does not make any more purchases this month. Calculate her balance owing next month if the credit card company charges 19.99% interest, compounded daily. Assume 31 days in the month.

\[
1955.84 \left(1 + \frac{0.1999}{365}\right)^{31} = 1989.32
\]

- 2016.84 - payment + interest = 1989.32 reduces it by $27.52 each month.

- 2016.84 ÷ 27.52 = 73.3 months = over 6 years!

19. Marge has no money in her bank account and needs to pay her mechanic today. She gets paid in two weeks. Payday Loan charges a fee of $23 for every $100 borrowed. After two weeks, you must pay back what you owe plus the fee.

a) If Marge borrows $750 to pay her mechanic, how much will she need to pay back in two weeks?

\[
750 + \left( \frac{750}{100} \times 23 \right) = 922.50
\]

b) What percent interest did Mary pay when borrowing money from Payday Loan?

- Hint: It is more than 23%.

\[
\frac{172.50}{750 \times \left( \frac{2}{52} \right)} = 5.98 \times 100 = 598\%
\]

20. What is a budget?

A plan for how you will spend your income.
21. Explain the difference between a deficit and surplus budget situation.

- **Deficit**: you spend more than you earn.
- **Surplus**: your income is greater than your expenses.

22. Give an example of a recurring expense.

- Rent: occurs every month.

23. Give an example of an expense that occurs every month but is not the exact same amount. Explain why this is so.

- Gas or groceries: prices change.

24. Len earns $86 for 8 hours of work at his new job.

   a) Calculate Len’s hourly wage.

   \[
   \frac{$86}{8} = $10.75 \text{ per hour.}
   \]

   b) Write a formula that Len can use to figure out his pay with any number of hours.

   \[
   \text{Pay} = $10.75 \times \text{hours}
   \]

25. Why is making a conservative budget (expenses rounded up and income rounded down) a good idea? Explain.

   - If expenses go up, you are still **deficit free**!
26. What is it called when you put money into savings each month?

[paying yourself first.]

27. How much money do financial “experts” say you should put into savings each month?

[10% of your income.]

28. Susan earns $3200 every month before deductions.

a) What is Susan’s gross pay?

[$3200]

b) If her deductions are 33% of her gross pay, calculate the amount of her deductions.

[3200 \times 0.33 = $1056]

c) What is Susan’s net pay?

[3200 - 1056 = $2144]

d) How much money should Susan put aside every month for savings if she follows the recommended guidelines?

[2144 \times 0.10 = $214.40]
29. Underestimating expenses can have disastrous results. How can you be sure your expenses are accurate?

\[ \text{Keep track of your expenses for several months.} \]

30. If your expenses regularly exceed your income, what steps should you take? Be specific.

\[ \text{Eliminate things from your budget that are not necessary.} \]
\[ \text{Ex: entertainment, eating out} \]

31. An older friend (someone who has CPP, EI, and income tax deductions) of yours brags that they make $17.68 an hour!

a) If they work a 40-hour week, what do they make in a year?

\[ 40 \times 52 \times 17.68 = \underline{36,774.48} \]

b) Assuming they have typical deductions (CPP, EI, and income tax), what would their take-home pay be every month? Estimate (assume deductions are 30% of gross pay).

\[ 36,774.48 \div 12 = 3064.53 \text{ gross} \]
\[ - 30\% \text{ ded} \]

\[ \underline{2145.17} \text{ take home pay} \]
32. Marley has the following expenses every month:
   Apartment rent $475
   Cell phone bill $60
   Groceries $325
   Eating out $30
   Gasoline $65

   a) Which expenses will remain the same every month?

      o apartment rent
      o possibly cell phone bill if he does not go over his limit.

   b) Why do some expenses change every month?

      price change
      + price of gas. goes up or down.

   c) How much money does Marley have to make every month to have a balanced budget?

      amount equal to expenses.

      \[ 475 + 60 + 325 + 30 + 65 = \$955.00 \]

   d) If Marley earns $10.50 per hour, how many hours does he need to work at a minimum each month if he wants to put $200 into savings plus pay for all his expenses?

      \[ 955 + 200 = \$1155 \text{ needed} \]

      \[ 1155 \div 10.50 = 110 \text{ hours at least} \]

      because there are deductions
33. Another friend of yours earns $2400 each month. She wants to save money to buy a $9,600 car. She tells you she can buy the car in 4 months. What kind of questions and/or advice would you give your friend? At least 4 questions or tips please.

- What are your other expenses?
- $9600 \div 4 = 2400 each month!
- Wow! That will be almost impossible.
- Maybe wait a bit longer.

34. Mark spends $875.00 on food every month and this accounts for 45% of his net monthly income. How much should Morley spend on food to bring his monthly percentage down to 25%?

\[
\begin{align*}
\text{Step 1: } & \quad \text{Total} \times 0.45 = 875 \\
& \quad \text{Total} = 1944.44 \\
\text{Step 2: } & \quad 1944.44 \times 0.25 = 486.11
\end{align*}
\]

35. After creating your own budget, you should have some sense of your expenses every month. Imagine that you suddenly lost your job. What balance would you need in your savings account to survive for two months (necessary expenses) while you looked for work? Show your calculations if necessary.

\[
\text{probably rent + food at least } (750 + 400) \times 2 = \$2300 \text{ or more if you have a phone bill.}
\]

36. Did you think about a bank when you did your moving out project? If you didn’t do this, explain what you would look for in a bank. Think about fees.

- convenient location
- atm
- low or no fees.

37. You have spent some time planning your budget. Give an example of an unexpected expense that would require you to pay more than you had budgeted.

blow a motor in your car. Oops. Big $$$ to repair or get another used one.
38. Where would the money come from in the above situation?
   - probably savings.
   - maybe a loan from grandma or the bank.

39. Give an advantage and a disadvantage to banking online instead of walking/biking/driving to your bank.
   - easy to check balance, if pay went in, etc.
   - people might hack into your account.

40. List at least four tips for "safe" debit card use.
   - don't show your card with friends
   - don't give out pin
   - don't make pin 1234
   - don't use suspicious lock-up atm machines.

41. Explain what happens when you write a cheque and there is not enough money in your account.
   It will bounce - called an NSF cheque.

42. What is the purpose of a cheque register?
   To keep track of you cheques written and your account balance.

43. John makes $78,000 per year and his wife Mary makes $700 weekly. How much is their monthly income for budget purposes?

\[
78000 + (700 \times 52) = \frac{114400}{12} = \$9533.33 \text{ per month.}
\]
Essential Math 30S – Exam Review

44. Bob buys a sandwich every day for lunch at the cafeteria. Instead of buying a sandwich every day for $2.75, he wants to make his own.

A jar of sandwich spread is $3.29 and should last 8 weeks.  
A container of margarine is $4.99 and should last 8 weeks.  
A package of sandwich meat is $3.99 and should last one week.  
A loaf of bread is $3.49 and should last one week.

Assume each week above is a 5 day work week.

a) Calculate the cost of a sandwich if Bob makes it on his own.

$1.70

b) How much money does Bob save in a year if he makes his own sandwiches?

5 days a week × 52 weeks = 260 sandwiches

$2.75 - $1.70 = $1.05 saved × 260 = $273

45. Write out a cheque to Mr. Dueck for $7,500.25. Date it with today’s date and sign your name.

John Doe
Any Street
City, Province
Postal Code

Pay to the order of Mr. Dueck $7,500.25

Seventeen Thousand Five Hundred

Any Bank
Your Town
Province
46. Write out a cheque to Pizza Palace for $37.00. Date it with today's date and sign your name.

[Cheque image]

Pay to the order of Pizza Palace $37.00
Hundred Seven DOLLARS

ANY BANK
YOUR TOWN
PROVINCE

Jan 27 2014
47. Complete a cheque register with the following information. You have probably seen your parents or grandparents do this. Try to arrive at the correct final balance in your chequing account. Use the official Cheque Register form to help organize your calculations.

Balance: Nov 1, $1,234.90

Cheque No. 151: Nov 2 to The Source for $67.89
152: Nov 3 to IGA for $124.32
153: Nov 4 to Mastercard for $500.00

<table>
<thead>
<tr>
<th>Date</th>
<th>Cheque No.</th>
<th>Cheque No.</th>
<th>Cheque/Amount</th>
<th>Description</th>
<th>Deposited</th>
<th>Cheque Deposited</th>
<th>Balance Forwards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nov 1</td>
<td>151</td>
<td>To The Source</td>
<td>67.89</td>
<td>Balance</td>
<td>$1,234.90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nov 3</td>
<td>152</td>
<td>To IGA</td>
<td>124.32</td>
<td>Balance</td>
<td>$1,167.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nov 4</td>
<td>153</td>
<td>To Mastercard</td>
<td>500.00</td>
<td>Balance</td>
<td>$1,042.69</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

48. Calculate how much money you will deposit into your bank account using the following information. You have 15 quarters, 10 loonies, 2 five-dollar bills, 3 twenty-dollar bills, and 2 cheques for $146.00 and $351.95. You want to withhold $25 cash.

\[
15 \times 0.25 \quad = \quad 3.75 \\
10 \times 1.00 \quad = \quad 10.00 \\
2 \times 5.00 \quad = \quad 10.00 \\
3 \times 20.00 \quad = \quad 60.00 \\
146.00 \\
351.95 \\
\hline 
581.70 \\
\hline -25 \text{ cash} \\
\hline \text{17$556.70 deposit.} \\
\]
49. Find the measure of the missing angle. Show your work.

![Diagram of a triangle with angles 53° and 90°, and the missing angle labeled as ?].

Given:
\[ \angle 53° + \angle 90° + \angle ? = 180° \]
\[ 180° - 53° - 90° = 37° \]

50. A rectangular cement pad in front of a garage is 24 feet wide and 32 feet long.
   a) Draw a sketch.

   ![Sketch of a rectangle with dimensions 24 feet by 32 feet and a diagonal line labeled C.]

   b) Draw a diagonal line from corner to corner and then calculate the length of the diagonal line.

   \[ C = \sqrt{24^2 + 32^2} \]
   \[ C = \sqrt{576 + 1024} \]
   \[ C = \sqrt{1600} \]
   \[ C = 40 \text{ ft} \]

51. Find the missing side in the triangle below:

   ![Diagram of a right triangle with angle 38°, adjacent side labeled adj, hypotenuse labeled hyp, and a line labeled 32 hyp.]

   \[ \cos 38° = \frac{x}{32} \]
   \[ x = 25.2 \]

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52. Find the missing angle in the triangle below:

\[ \theta = \tan^{-1} \left( \frac{43}{32} \right) \]
\[ \theta = 53.3^\circ \]

53. Find the missing angle in the triangle below:

\[ \theta = \cos^{-1} \left( \frac{31}{53} \right) \]
\[ \theta = 54.2^\circ \]

54. Mary wants to build a fence around her garden plot to keep her lamb from eating her vegetables. Mary has very little money and her local lumberyard does not allow customers to return fencing. How many feet of fencing should she buy?

\[ \text{Fencing} = 13 + 13 + 4.7 + 13.8 \]
\[ \text{Total} = 57.54 \text{ feet} \]
55. Billy wants to fence in an area for his goats. Calculate the perimeter of the area.

\[ \text{Perimeter} = 19.9 + 50 + 24.6 + 30 = 124.5 \text{ ft} \]

56. A maple tree casts a shadow that is 35 feet long. The angle of elevation to the sun is 33°. How tall is the tree?

\[ \tan 33 = \frac{x}{35} \]

\[ x = 22.7 \text{ ft} \]

57. From the top of a 180 meter building, the angle of elevation to the top of another building is 38°. The angle of depression to the bottom of the second building is 24°. How tall is the second building?

\[ \tan 38 = \frac{x}{464.3} \]

\[ x = 315.9 \]

\[ \tan 24 = \frac{180}{x} \]

\[ x = 464.3 \]

\[ \text{Step 1:} \quad 180 + 315.9 = 495.9 \text{ m tall} \]
58. Bernie is in a rowboat, rowing across Lake Itasca. In the distance, he sees an eagle perched on the top branch of a spruce tree. He estimates he is about a kilometer from the tree. Pulling a protractor out of his shirt pocket, he estimates the angle of elevation to the eagle to be $8^\circ$. How tall is the tree?
Hint: Draw a sketch, label, and then solve.

\[
tan 8^\circ = \frac{x}{1000} \implies x = 140.5 \text{ m}
\]

59. Jeff has purchased a small shark (about 3 feet long) on Ebay and wants to build a large shark tank in his bedroom. He needs to build a tank that is 8 feet long by 6 feet wide and 4 feet high.

a) Draw a net of the shark tank.

b) Calculate the surface area of the glass needed to build the tank.

- Sides: $4 \times 8 \times 2 = 64$
- Ends: $6 \times 4 \times 2 = 48$
- Base: $6 \times 8 = 48$

Total surface area: $208 \text{ ft}^2$

\[
208 \times 11.99 = 2493.92 
\]

+ taxes = $2818.13
60. Bill’s truck box is 6.5 feet long, 4 feet wide, and 20 inches deep. He wants to make a portable swimming pool. How many litres of water will it take to fill up the entire box? Remember that there are 12 inches in a foot and that 1 inch is 2.54 cm.

\[6.5 \times 12 \times 2.54 = 198.12 \text{ cm}^3\]
\[4 \times 12 \times 2.54 = 121.92 \text{ cm}^3\]
\[20'' \times 2.54 = 50.8 \text{ cm}^3\]

First, convert the volume to cubic feet:

\[198.12 \times 121.92 \times 50.8 = 1227063.35 \text{ cm}^3\]
\[= 1227 \text{ ft}^3\]

Next, convert the volume to litres:

\[= 1227 \times \frac{1000}{1000} = 1227 \text{ L}\]

61. Julie is mixing punch for her grandmother’s birthday party. The container says to mix 3 cans of water with 1 can of juice. If Julie wants to keep the same proportion of water to juice, calculate:

a) If a can is 10 ounces, how many ounces of juice will 2 cans make?

\[\frac{3 \text{ water}}{1 \text{ juice}} \Rightarrow \frac{4 \text{ cans}}{60 \text{ oz}} \Rightarrow \frac{2 \text{ cans}}{X} \times 3 = 60 \text{ oz water}\]

\[2 \times 10 \text{ oz} = 20 \text{ oz water} + 60 \text{ oz water} = 80 \text{ oz total}\]

b) What percentage of a pitcher of juice is juice concentrate?

\[25\% \text{ of 4 total}\]

62. Calculate the surface area and the volume of both shapes.

For the rectangular prism:

- Height: \(10 \text{ cm}\)
- Width: \(30 \text{ cm}\)
- Length: \(7 \text{ cm}\)

\[10 \times 7 \times 2 = 140\]
\[7 \times 30 \times 2 = 420\]
\[10 \times 30 \times 2 = 600\]

Total is \(1160 \text{ cm}^2\)

For the cylinder:

- Radius: \(15 \text{ cm}\)
- Height: \(10 \text{ cm}\)

\[SA_{\text{curved}} = \pi \times r \times h\]
\[= 2 \times \pi \times 15 \times 10 = 942.5\]
\[Total = 1413.7 + 942.5 = 2356.2 \text{ cm}^2\]
63. A basketball has a circumference of 29.5 inches. How much leather, to the nearest square inch, is needed for the surface?

\[
C = \pi d = 29.5 = \pi d = 9.4
\]

The surface area of a sphere is given by

\[
SA_{sphere} = 4\pi r^2 = 4\pi (4.7)^2 = 277.6 \text{ in}^2
\]

64. Daryl has a summer job painting fences. He is asked to paint a wooden fence that runs around the perimeter of a yard that is 88 feet wide and 165 feet long. The fence is 6 feet tall and needs to be painted on both sides.

a) What is the total surface area that he must paint?

\[
\text{area} = 88 \times 6 + 165 \times 6 + 88 \times 6 + 165 \times 6 = 3036 \text{ ft}^2
\]

b) A one-gallon can of the stain that Daryl is using covers approximately 225 ft\(^2\). If Daryl applies 2 coats of stain, how many cans of stain should he buy?

\[
3036 \times 2 \text{ cans} = 6072
\]

\[
\div 225 \text{ per can}
\]

\[
26.98 \approx 27 \text{ cans}
\]

65. Larry is estimating the cost to re-shingle his roof. To determine the number of shingles, he must calculate the surface area of the roof. The roof is shaped like a pyramid with each side having a base length of 25 feet and a slant height of 15 feet 3 inches.

a) What is the total surface area he needs to cover?
66. A grain stockpile cover in the shape of a cone has a diameter of 96 m and a height of 23 m. How much material is needed for the cover?

\[ \text{Area of curved part is } \pi r s = \pi \times 48 \times 53.2 = 8022.4 \text{ m}^2 \]

67. A bakery stores flour in a cylindrical bin 70 cm high and with a diameter of 50 cm.

a) What volume of flour does the bin hold?

\[ \text{Vol} = \pi r^2 h = \pi \times 25^2 \times 70 = 13744.7 \text{ cm}^3 \]

b) The bakery orders flour in 20-kg sacks. Each sack is approximately 46 cm wide, 80 cm long, and 15 cm thick. How many sacks of flour fit in the bin?

\[ \text{Vol} = 46 \times 80 \times 15 = 55200 \text{ cm}^3 \text{ per sack} \]

\[ 13744.7 \div 55200 = 2.49 \text{ or } 2 \frac{1}{2} \text{ bags fit in} \]

c) How many kilograms of flour does the bin hold?

\[ 2.49 \times 20 \text{ kg} = 49.8 \text{ kg} \]

d) The bakery stores salt in a bin that has one half the height and one half the diameter. Using your answer from part a) and proportional reasoning for volume, what is the volume of salt in the bin?

\[ \text{My head is hurting...} \]

\[ \text{Volume is less... Check answer} \]

\[ \text{to 686}! \]
68. A gravel pile in a maintenance yard has a diameter of 3.5 metres and a height of 1.2 metres.

a) What is the volume of gravel in the pile?

\[
V_{\text{cone}} = \frac{\pi r^2 h}{3} = \frac{\pi \times 1.75^2 \times 1.2}{3} = 3.85 \text{ m}^3
\]

b) What will be the volume of a stockpile with double the dimensions? Use proportional reasoning.

\[
r = 3.5 \quad V_{\text{vol}} = \frac{\pi \times 3.5^2 \times 2.4}{3} = 30.8 \text{ m}^3
\]

69. A steel storage silo for livestock feed pellets is shown below.

a) What is the volume of the silo in cubic centimeters?

\[
V_{\text{cyl}} = \pi r^2 h = \pi \times 90^2 \times 157 = 3,995,163.4 \text{ cm}^3
\]

\[
V_{\text{cone}} = \frac{\pi r^2 h}{3} = \frac{\pi \times 90^2 \times 193}{3} = 16,370,839.9 \text{ cm}^3
\]

\[
56,324,73 \text{ cm}^3
\]
b) Express the volume in cubic meters.

\[ 563,2247.3 \div 1,000 = 5.6 \text{ m}^3 \]

c) If you filled the silo with water, how many litres would it hold?

\[ 563,2247.3 \div 1,000 = 5632.2 \text{ L} \]

70. What volume of concrete, in cubic yards, is needed to make the stairs shown below? Assume the stairs are all the same size.

\[ A = 30 \times 48 \times 48 = 69,120 \text{ in}^3 \]

\[ B = 7.5 \times 10 \times 48 = 3600 \times 6 \text{ of them} = 21,600 \text{ in}^3 \]

\[ \text{Total vol} = 69,120 + 21,600 = 90,720 \text{ in}^3 \]

\[ = \frac{90,720}{12^3} = \frac{90,720}{1728} = 52.5 \text{ ft}^3 \]

\[ = \frac{52.5}{3^3} = \frac{52.5}{27} = 1.94 \text{ yds}^3 \]
71. Use graph paper to draw the following views for the toy box shown below:
   a) top, side, and front view (label and add dimensions to the sketch)
   b) exploded view (assume there is a bottom)
   c) component parts view (assume there is a bottom)

---

72. A survey of 145 people revealed their favorite fruit:

<table>
<thead>
<tr>
<th>Fruit</th>
<th>Apple</th>
<th>Orange</th>
<th>Banana</th>
<th>Kiwifruit</th>
<th>Blueberry</th>
<th>Grapes</th>
</tr>
</thead>
<tbody>
<tr>
<td>People</td>
<td>35</td>
<td>30</td>
<td>10</td>
<td>25</td>
<td>40</td>
<td>5</td>
</tr>
</tbody>
</table>

Construct a bar graph. Include a title as well as labels for the x-axis and the y-axis.

73. Imagine you just did a survey of your friends to find which kind of movie they liked best.

Here are the results:

<table>
<thead>
<tr>
<th>Comedy</th>
<th>Action</th>
<th>Romance</th>
<th>Drama</th>
<th>SciFi</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>5</td>
<td>6</td>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>

Construct a pie graph. Include a title and label the slices with percentages.
74. The histogram shows the heights of 21 students in a class, grouped into 5-inch groups.

How many students were greater than or equal to 60 inches tall?

75. A class carried out an experiment to measure the lengths of cuckoo eggs. The length of each egg was measured to the nearest mm. The results are shown in the following histogram:

How many eggs were measured altogether in the experiment?