

REVIEW CHAPTER 1 Algebraic Tools for Operating With Functions

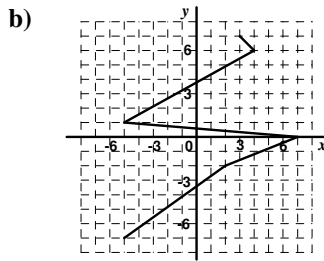
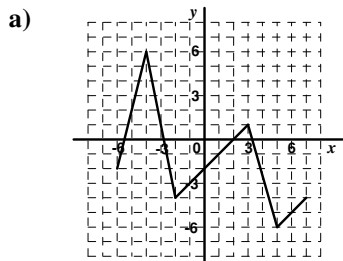
- Simplify $(15x^2 + 9x - 4) - (7x^2 - 2x - 14)$.
- Expand and simplify.
 - $3x(2x+1) + x(-3x-2) - 4x(x+6)$
 - $(10x+1)(3x-4)$
 - $(3x^2 - 3x + 1)(2x^2 + x - 1)$
- Simplify each of the following. State any restrictions on the variables.
 - $\frac{14x^4 + 28x^3 - 7x^2}{7x}$
 - $\frac{6-4x}{2x-3}$
 - $\frac{2x^2 + x - 1}{x^2 + 4x + 3}$
 - $\frac{12c^8}{5d^2} \times \frac{15d^5}{36c^9}$
 - $\frac{x+4}{x+1} \times \frac{x^2 - x - 2}{x^2 - x - 20}$
 - $\frac{2x^2 + 4x}{x^2 - 4x + 3} \div \frac{x^2 - 4}{x^2 + 2x - 15}$
- Simplify each of the following. State any restrictions on the variables.
 - $\frac{x-8}{2x+5} + \frac{3x+5}{2x+5}$
 - $\frac{2x-7}{3} - \frac{x+1}{2} + \frac{3x-1}{5}$
 - $\frac{8}{1-2x} + \frac{6}{2x-1}$
 - $\frac{2}{3s^3} + \frac{5}{s} - \frac{2}{5s^2}$
 - $\frac{-4}{3w+9} + \frac{6}{4w+12}$
 - $\frac{10}{v^2+7v+10} - \frac{7}{v^2+4v-5}$
- Lucy's hockey team is selling candy bars, at \$2 each, to raise money for a tournament. It costs the team 50¢ to purchase each bar, with a fixed shipping cost of \$35. How many bars must be sold for the team to earn at least \$100?

REVIEW CHAPTER 2 Quadratic Functions and Equations

- Simplify.
 - $\sqrt{98}$
 - $\frac{\sqrt{405}}{\sqrt{15}}$
 - $\sqrt{\frac{6}{25}}$
 - $8\sqrt{3} \times 5\sqrt{11}$
 - $4\sqrt{10} \times 3\sqrt{5}$
- Find the maximum or minimum value of the following functions by completing the square.
 - $y = 5x^2 - 10x + 14$
 - $y = -0.7x^2 - 11.2x - 25.6$
 - $y = 6x^2 - 7x + 2$
- Find the maximum product of two numbers whose sum is 47.
- Solve by completing the square. Express answers as exact roots and as approximate roots, to the nearest hundredth, if necessary.
 - $x^2 - 11x - 26 = 0$
 - $3x^2 + 8x - 2 = 0$
 - $2x^2 - x + 3 = 0$
- Solve $10x^2 - 3x = -2x + 2$ by factoring. Check the solution.
- Solve $2x^2 + 7x + 9 = 0$ using the quadratic formula.
- Simplify.
 - $\sqrt{54} - \sqrt{20} - \sqrt{24} + \sqrt{80}$
 - $-\sqrt{252} + \sqrt{162} + \sqrt{112} - \sqrt{50}$
- Expand and simplify $4\sqrt{5}(6\sqrt{10} - 3\sqrt{35})$.
- Simplify.
 - $-\frac{1}{5\sqrt{3}}$
 - $(2\sqrt{5} + 7\sqrt{6})(2\sqrt{5} - 7\sqrt{6})$
 - $\frac{4}{\sqrt{14} + 4\sqrt{3}}$
- Solve each system of equations.
 - $y = 2x + 1$
 $(x-1)^2 + y^2 = 53$
 - $x - 4y = -4$
 $x^2 + 16y^2 = 16$
 - $3x + y - 5 = 0$
 $y = x^2 + 1$
 - $x + 3y = 3$
 $2x^2 - 9y^2 = 18$

REVIEW CHAPTER 3 Transformations of Functions

1. Determine if each relation is a function.



2. State the domain and range of each relation. Determine if each relation is a function.

a) $\{(17, 2), (11, -14), (-2, -2), (5, 45), (117, -118)\}$

b) $y = -x^2 + 1$

c) $y = \frac{1}{2}x - 3$

3. If $f(x) = 5x^2$, find

a) $f(-4)$

b) $f(0)$

c) $f(10)$

4. How do the graphs of $y = \frac{1}{x} + 4$ and $y = \frac{1}{x} - 1$ compare with the graph of $y = \frac{1}{x}$?

5. How do the graphs of $y = \frac{1}{x-5}$ and $y = \frac{1}{x+8}$ compare with the graph of $y = \frac{1}{x}$?

6. Sketch the graph of $y = \sqrt{x+1} - 2$.

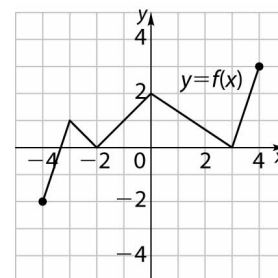
7. a) Given the graph of $y = f(x)$, as shown, graph $y = -f(x)$ and $y = f(-x)$ on the same axes.

b) Describe how the graphs of $y = -f(x)$ and $y = f(-x)$ are related to the graph of $y = f(x)$.

8. If $f(x) = \sqrt{x-2} + 1$, write an equation to represent each of the following functions, describe how the graph of each function is related to the graph of $y = f(x)$, sketch each graph, state the domain and range, and identify any invariant points.

a) $y = -f(x)$

b) $y = f(-x)$



9. a) Find the inverse f^{-1} of the function f whose ordered pairs are $\{(3, -10), (1, -9), (-8, 4)\}$.

b) Graph both functions.

10. For $f(x) = -2x + 5$ and $g(x) = x^2 + 2$:

a) find the inverse

b) graph the function and its inverse function

c) determine whether the inverse is a function

d) determine the domain and the range of the function and its inverse function

11. a) Graph $y = x^2$, $y = 3x^2$, and $y = \frac{1}{4}x^2$ on the same grid.

b) Describe how the graphs of $y = 3x^2$ and $y = \frac{1}{4}x^2$ are related to the graph of $y = x^2$.

12. a) Given the graph of $y = f(x)$, sketch the graphs of $y = \frac{1}{3}f(x)$, $y = 2f(x)$, $y = f(3x)$, and $y = f\left(\frac{1}{4}x\right)$.

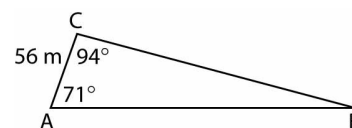
b) Describe how the graph of each of the functions in part a) is related to the graph of $y = f(x)$.

13. If $f(x) = \sqrt{x}$, sketch the graphs of $y = f(x)$ and $y = -3f(x + 1) + 1$.
14. The graph of $y = x^2$ is compressed vertically by a factor of $\frac{1}{5}$, reflected in the x -axis, and translated 4 units to the right and 2 units upward. Write the equation of the transformed function.

REVIEW CHAPTER 4 Trigonometry

Don't do #3

- In $\triangle XYZ$, $\angle X = 90^\circ$, $\angle Y = 54.2^\circ$, and $y = 4.1$ cm. Solve the triangle by finding
 - the unknown angle
 - the unknown sides, to the nearest tenth of a centimetre
- In $\triangle PQR$, $\angle Q = 90^\circ$, $p = 14.9$ m, and $r = 18.3$ m. Solve the triangle by finding the
 - unknown angles, to the nearest tenth of a degree
 - unknown side, to the nearest tenth of a metre
- Find the length of the 42° parallel of latitude, to the nearest 10 km. Assume that the radius of the Earth is 6380 km.
- To calculate the height of a tree, Marie measures the angle of elevation from a point A to be 34° . She then walks 10 m directly toward the tree, and finds the angle of elevation from the new point B to be 41° . What is the height of the tree, to the nearest tenth of a metre?
- The point (24, 10) is on the terminal arm of an angle θ in standard position. Find $\sin \theta$ and $\cos \theta$.
- The point (-6, 8) is on the terminal arm of an angle θ in standard position. Find $\sin \theta$ and $\cos \theta$.
- Evaluate, to four decimal places.
 - $\sin 64.7^\circ$
 - $\cos 153^\circ$
- Find $\angle A$, to the nearest tenth of a degree, if $0^\circ \leq A \leq 180^\circ$.
 - $\cos A = 0.2421$
 - $\sin A = 0.7988$
- To measure the distance from a point A to an inaccessible point B, a surveyor picks out a point C and measures $\angle BAC$ to be 71° . He moves to point C, a distance of 56 m from point A, and measures $\angle BCA$ to be 94° . How far is it from A to B, to the nearest metre?



REVIEW CHAPTER 5 Trigonometric Functions

- Change each radian measure to degree measure. Round to the nearest tenth of a degree, if necessary.
 - $\frac{\pi}{15}$
 - 4.8
 - $\frac{7\pi}{9}$
- Find the exact radian measure, in terms of π , for each of the following.
 - 15°
 - 270°
 - 30°
- The point P(5, -2) lies on the terminal arm of an angle θ in standard position. Determine the exact values of $\sin \theta$, $\cos \theta$, and $\tan \theta$.
- Find the exact values of:
 - $\sin 210^\circ$
 - $\tan 210^\circ$
 - $\sin 150^\circ$
 - $\cos 120^\circ$
- Find the values of the sine, cosine, and tangent of an angle that measures
 - 180°
 - 270°

6. Sketch one cycle of each function.

a) $y = 3\sin x + 1$ b) $y = 2\cos(x - 45^\circ)$ c) $y = 0.5\sin 3(x + 90^\circ)$ d) $y = 5\cos\left(\frac{1}{3}x - 30^\circ\right) - 2$ e) $y = -2\sin(x - 180^\circ)$

7. Prove the following identities.

a) $\frac{\sin x}{\cos^2 x \tan x} = \frac{1}{\cos x}$ b) $\sin x = \frac{1}{\sin x} - \frac{\cos x}{\tan x}$ c) $\frac{\sin^2 x + \cos^2 x}{1 + \cos x} + \frac{1}{1 - \cos x} = \frac{2}{\sin^2 x}$

8. Solve the following equations for $0 \leq \theta \leq 2\pi$.

a) $2\cos \theta - \sqrt{3} = 0$ b) $7\sin \theta = 5\sin \theta - 1$

9. Solve the following equations on the interval $0^\circ \leq x \leq 360^\circ$. Round approximate solutions to the nearest tenth of a degree.

a) $4\sin^2 x + 2\sin x - 2 = 0$ b) $5\sin^2 x - 18\sin x - 8 = 0$

10. Solve $4 - 4\cos x = 4\sin^2 x - 1$ on the interval $0 \leq x \leq 2\pi$.

REVIEW CHAPTER 6 Sequences and Series

1. Given the formula for the n th term, write the first four terms of each sequence.

a) $t_n = 5n - 2$ b) $f(n) = 3n^2 - 2$ c) $t_n = 6n + 1$ d) $f(n) = -4n + 3$ e) $t_n = -7(3)^{n-1}$ f) $f(n) = 2(-4)^{n-1}$

2. Find the formula for the n th term that determines each sequence.

a) 7, 14, 21, 28, ... b) 6, 7, 8, 9, ... c) 7, 9, 11, 13, ... d) 14, 11, 8, 5, ... e) 4, 20, 100, 500, ... f) 256, 128, 64, 32, ...

3. Find the indicated terms.

a) $t_n = 4.5n - 8$; t_6 b) $f(n) = -0.8n - 0.4$; t_{20} c) $t_n = 5(-2)^{n-1}$; t_7 d) $f(n) = 8(0.1)^{n-1}$; t_4

4. Find the number of terms in each of the following sequences.

a) 8, 11, 14, ..., 50 b) 9, 7, 5, ..., -9 c) 9, 18, 36, 72, ..., 1152 d) 0.0625, 0.25, 1, 4, ..., 4096

5. Find a and d , and write the formula for the n th term, t_n , of arithmetic sequences with the following terms.

a) $t_3 = 22$ and $t_8 = 67$ b) $t_2 = -9$ and $t_{10} = 39$

6. Find a , r , and t_n for each geometric sequence. a) $t_3 = -72$ and $t_5 = -2592$ b) $t_4 = 270$ and $t_6 = 2430$

7. Determine whether each sequence is arithmetic, geometric, or neither. Then, find the next two terms.

a) 3, 12, 27, 48, ... b) 19, 13, 7, 1, ... c) 4, 2, 1, 0.5, ... d) -0.8, -0.6, -0.4, -0.2, ...

8. Use the recursion formula to write the first five terms of each sequence.

a) $t_1 = 8$; $t_n = t_{n-1} - 2$ b) $t_1 = -9.5$; $t_n = t_{n-1} + 1.5$ c) $t_1 = -3$; $t_n = -4t_{n-1}$ d) $t_1 = 160$; $t_n = 0.2t_{n-1}$

9. Explain why $t_n = t_1 + (n - 1)k$ is an explicit formula for the sequence with recursion formula $t_n = t_{n-1} + k$ and $t_1 = t_1$.

10. Find the indicated sum for each arithmetic series. a) S_8 for $15 + 21 + 27 + \dots$ b) S_{12} for $4 - 1 - 6 - \dots$

11. Find the indicated sum for each geometric series. a) S_5 for $1 + 7 + 49 + \dots$ b) S_7 for $3 - 6 + 12 - \dots$

12. A student paid \$5500 tuition for her first year attending a university. Tuition at the university is projected to increase \$750 a year for the next four years.

a) How much tuition should the student expect to pay for her fourth year at the university?

b) How much should the student expect to pay in tuition for all four years?

13. In an arithmetic series $t_3 = 30$ and $t_6 = 54$. Find the sum of the first 20 terms.

14. Two friends started a telephone chain. Each person in the chain called three people. Thus, there were six telephone calls in the first round.

a) How many telephone calls were made in the fifth round?

b) After eight rounds, how many telephone calls had been made in all?

REVIEW CHAPTER 7 Compound Interest and Annuities

1. To purchase a new computer, Prasanna borrows \$4000 at an interest rate of 5.25% per annum, compounded annually. He has arranged to pay back the loan in 3 years.

a) How much will Prasanna owe after 3 years? b) How much of this is interest?

2. Gwen wants to invest \$20 000. She must decide between a 12-year plan with an interest rate of 8% per annum, compounded quarterly, and a 12-year plan with an interest rate of 7.75% per annum, compounded monthly. Which plan earns Gwen more interest, and by how much?

3. What rate of interest, to the nearest hundredth of a percent, compounded semi-annually, would be required for an investment of \$70 000 to grow to \$110 000 after 8 years?

4. Marc needs to save \$20 000 for a home gym, which he would like to have in 6 years. How much should he invest today at an interest rate of 7% per annum, compounded quarterly?

5. P. J. needs \$14 000 in 5 years to purchase a van. P. J.'s bank has offered her two investment plans: 3.6% per annum, compounded quarterly, or 3.55% per annum, compounded monthly. Which plan requires a smaller investment, and by how much?

6. To save money for college, Ronna plans to deposit \$250 into an account at the end of every three months for the next two years. She will begin making payments three months from now. If her account has an interest rate of 4% per annum, compounded quarterly, how much will Ronna have after she makes her last payment?
7. Benny has 30 months to pay off a loan of \$8227.33. He plans to make a payment into an account at the end of every month. The interest rate is 7.5% per annum, compounded monthly.
- a) How much will each of Benny's payments be? b) How much does the loan cost Benny?
8. Clarence has \$20 000 in the bank. He wants to create an investment to pay his \$230 monthly car insurance payments for four years, with the first payment due in one month. How much of his \$20 000 should he invest now at 8.25% per annum, compounded monthly?
9. Half of the \$5542 raised in a charity raffle is invested in an account at 7.1% per annum, compounded quarterly. The winner of the raffle is to receive payments from this account every three months for the next five years, beginning three months from now. How much are the payments?
10. Penny's parents have agreed to loan her \$4500 to pay her tuition. They are charging her an interest rate of 3% per annum, compounded monthly. Penny has arranged to pay them \$160 per month to pay off the loan.
- a) how long it takes Penny to pay off the loan b) the amount of her final payment
11. Jack is purchasing a house that he plans to rent to students attending community college. The price of the house is \$115 000. Jack makes a down payment of 12% of the price and agrees to a mortgage at 6.8%, amortized over 15 years, for the balance of the price.
- a) How much is Jack's mortgage? b) How much are Jack's monthly payments?
12. Kun Wah has a \$90 000 mortgage, with an interest rate of 7.4%, amortized over 20 years. He is making monthly payments. July also has a \$90 000 mortgage, with an interest rate of 7.4%, but she is making biweekly payments. July's payments are half the amount of Kun Wah's monthly payments. Find the monthly payments for Kun Wah and the biweekly payments for July. How long does it take July to pay off her mortgage?

REVIEW: Exponential Functions

1. Sketch the curve for each of the following, and state
- i) the equation of the horizontal asymptote, ii) whether the function is increasing or decreasing,
iii) the y-intercept iv) domain and range
- a) $y = 3^x - 5$ b) $y = 2^x + 4$ c) $y = -4\left(\frac{1}{3}\right)^x$ d) $y = \left(\frac{1}{2}\right)^x + 2$ e) $y = -2(5^x) - 1$
2. Bacteria of a certain type are known to divide every hour, thus producing two bacteria for every previously existing bacterium. Suppose that 100 of these bacteria are breathed into Paul's lung.
- a) How many bacteria will live in his lung after 5 hours?
b) How many after t hours?
3. The doubling period of a bacteria culture is 15 min and it starts with 5000 bacteria. How many bacteria will there be after a) 15 min b) 1 hour.
4. An antique vase was purchased in 2000 for \$8000. If the vase appreciates in value by 6% per year, what is its estimated value in the year 2040, to the nearest thousand dollars?
5. A car depreciates by 15% per year. If you buy a car for \$15 000, find the value of the car in three years.
6. The population of the world was 6 billion in 1999. This population is growing exponentially and doubles every 35 years
- a) Estimate the world population in 2050, to the nearest half billion.
b) When will the population be 24 billion?

REVIEW : Pascal's Triangles & Binomial Theorem

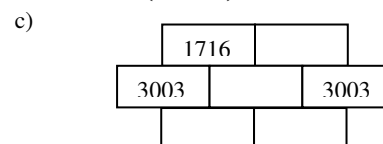
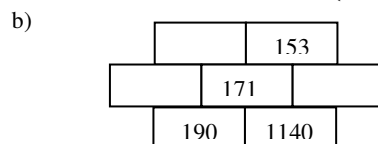
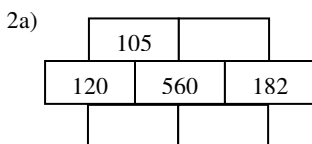
1. Expand and simplify each of the following.

a) $(2a + b)^3$

b) $(1 - x)^5$

c) $\left(1 + \frac{1}{x}\right)^4$

d) $\left(x - \frac{2}{x^2}\right)^5$



Exam Review Answers

Chapter 1: Answers

- 1) $8x^2 + 11x + 10$ 2a) $-x^2 - 23x$ b) $30x^2 - 37x - 4$ c) $6x^4 - 3x^3 - 4x^2 + 4x - 1$ 3a) $x(2x^2 + 4x - 1), x \neq 0$ b) $-2, x \neq \frac{3}{2}$ c) $\frac{2x-1}{x+3}, x \neq -3 \text{ \& } -1$
- d) $\frac{d^3}{c}, c \text{ \& } d \neq 0$ e) $\frac{x-2}{x-5}, x \neq -1, -4, 5$ f) $\frac{2x(x+5)}{(x-1)(x-2)}, x \neq -2, -5, 1, 2, 3$ 4a) $\frac{4x-3}{2x+5}, x \neq \frac{-5}{2}$ b) $\frac{23x-91}{30}$ c) $\frac{-2}{2x-1}, x \neq \frac{1}{2}$
- d) $\frac{10-6s+75s^2}{15s^3}, s \neq 0$ e) $\frac{1}{6(w+3)}, w \neq -3$ f) $\frac{3(v-8)}{(v+5)(v+2)(v-1)}, v \neq -5, -2, 1$ 5) $x \geq 90$

Chapter 2: Answers

- 1a) $7\sqrt{2}$ b) $3\sqrt{3}$ c) $\frac{\sqrt{6}}{5}$ d) $40\sqrt{33}$ e) $60\sqrt{2}$ 2a) 9 b) 19.2 c) $\frac{-1}{24}$ 3) $\frac{2209}{4}$ 4a) 13, -2 b) $\frac{-4}{3} \pm \frac{\sqrt{22}}{3}$ c) no solutions
5) $\frac{-2}{5}, \frac{1}{2}$ 6) no solutions 7a) $\sqrt{6} + 2\sqrt{5}$ b) $-2\sqrt{7} + 4\sqrt{2}$ 8) $120\sqrt{2} - 60\sqrt{7}$ 9a) $\frac{-\sqrt{3}}{15}$ b) -274 c) $\frac{-2\sqrt{14} + 8\sqrt{3}}{17}$
10a) (-3.4, -5.8) & (3, 7) b) (-4, 0) & (0, 1) c) (-4, 17) & (1, 2) d) (3, 0) & (-9, 4)

Chapter 3: Answers

- 1a) Yes b) No 2a) Yes $D: \{x | -2 \leq x \leq 117, x \in R\}$ $R: \{y | -118 \leq y \leq 45, y \in R\}$ b) Yes, $D: \{x | x \in R\}$ $R: \{y | y \leq 1, y \in R\}$ c) Yes, $D: \{x | x \in R\}$ $R: \{y | y \in R\}$ 3a) 80 b) 0 c) 500 4) up 4, down 1 5) Right 5, Left 8 7b) $-f(x)$: reflect in x-axis, $f(-x)$: reflect in y-axis
8a) $-f(x) = -\sqrt{x-2} - 1$ Inv. Pt: None b) $f(-x) = \sqrt{-x-2} + 1$ Inv. Pt: None 9a) (-10, 3), (-9, 1), (4, -8) 10i) a) $f^{-1}(x) = \frac{-1}{2}x + \frac{5}{2}$ c) Yes
d) $f: x \in R, y \in R$ $f^{-1}: x \in R, y \in R$ ii) a) $f^{-1}(x) = \pm\sqrt{x-2}$ c) No d) $f: x \in R, y \geq 2$ $f^{-1}: x \geq 2, y \in R$ 11b) v.s. by 3 v.s. by $\frac{1}{4}$
12b) v.s. by $\frac{1}{3}$, v.s. by 2, h.s. by $\frac{1}{3}$, h.s. by 4 14) $y = \frac{-1}{5}(x-4)^2 + 2$

Chapter 4: Answers

- 1a) $\angle Z = 35.8^\circ$, b) $x = 5.1, z = 2.95$ 2a) $\angle P = 39.2^\circ, \angle R = 50.8^\circ$ b) $q = 23.6$ 3) 29790 km 4) 30.1
5) $\sin \theta = \frac{5}{13}, \cos \theta = \frac{12}{13}$ 6) $\sin \theta = \frac{4}{5}, \cos \theta = \frac{-3}{5}$ 7a) 0.9041 b) -0.8910 8a) 76° b) 53° or 127° 9) 215.84
10) $\angle A = 18.3^\circ, \angle B = 16.8^\circ, c = 2.2$ 11) $\angle D = 131.8^\circ, \angle E = 23.4^\circ, \angle F = 24.8^\circ$ 12) $m = 10.4, \angle L = 85.2^\circ, \angle K = 48.2^\circ$ 13) $r = 7.2, \angle T = 26.6^\circ, \angle R = 121.4^\circ$
14) $L = 14, \angle L = 54.3^\circ, \angle K = 75.3^\circ$ or $L = 7.3, \angle L = 24.9^\circ, \angle K = 104.7^\circ$

Chapter 5: Answers

- 1a) 12° b) 275° c) 140° 2a) $\frac{\pi}{12}$ b) $\frac{3\pi}{2}$ c) $\frac{\pi}{6}$ 3) $\sin \theta = \frac{-2}{\sqrt{29}}, \cos \theta = \frac{5}{\sqrt{29}}, \tan \theta = \frac{-2}{5}$ 4a) $\frac{-1}{2}$ b) $\frac{\sqrt{3}}{3}$ c) $\frac{1}{2}$ d) $\frac{-1}{2}$ 5)

	180°	270°
sin	0	-1
cos	-1	0
tan	0	/

Chapter 6: Answers

- 1a) 3, 8, 13, 18 b) 1, 10, 25, 46 c) 7, 13, 19, 25 d) -1, -5, -9, -13 e) -7, -21, -63, -189 f) 2, -8, 32, -128 2a) $t_n = 7n$
b) $t_n = 5 + n$ c) $t_n = 5 + 2n$ d) $t_n = 17 - 3n$ e) $t_n = 4(5)^{n-1}$ f) $t_n = 256\left(\frac{1}{2}\right)^{n-1}$ 3a) 19 b) -16.4 c) 320 d) 0.008
4a) 15 b) 10 c) 8 d) 9 5a) $a = 4, d = 9$ b) $a = -15, d = 6$ 6a) $a = -2, r = 6$ or -6 b) $a = 10, r = 3$ or -3
7a) neither b) A.S. -5, -11 c) G.S. 0.25, 0.125 d) A.S. 0, 0.2 8a) 8, 6, 4, 2, 0 b) -9.5, -8, -6.5, -5, -3.5 c) -3, 12, -48, 192, -768
d) 160, 32, 6.4, 1.28, 0.256 10a) 288 b) -282 11a) 2801 b) 129 12a) 7750 b) 26500 13) 1800 14a) 486 b) 19680

Chapter 7: Answers

- 1a) 4663.65 b) 6663.65 2) 1202.58 3) 5.73% 4) 13188.76 5) Plan 1 by \$22.93 6) 2071.42
7a) 301.61 b) 820.97 8) 9376.10 9) 165.81 10a) 2 yrs and 5 months b) 4671.86
11a) 101200 b) 893.04 12) Kun Wah: 713.44 July: 356.72 Approx 16 years & 10 months

Exponential Functions Answers

1.

	Equation of Asymptote	Function is	y - intercepts	Domain	Range
a.	$y = -5$	increasing	-4	$x \in R$	$y > -5$
b.	$y = 4$	increasing	5	$x \in R$	$y > 4$
c.	$y = 0$	decreasing	4	$x \in R$	$y < 0$
d.	$y = 2$	decreasing	3	$x \in R$	$y > 2$
e.	$y = -1$	increasing	1	$x \in R$	$y < -1$

- 2a. 3200 b. $N(t) = 2^t \times 100$ 3a. 10 000 b. 80 000 4. \$82 000 5. \$9200 6a. 16.5 billion b. 2069

Binomial Theorem Answers

- 1a) $8a^3 + 12a^2b + 6ab^2 + b^3$ b) $1 - 5x + 10x^2 - 10x^3 + 5x^4 - x^5$ c) $1 + \frac{4}{x} + \frac{6}{x^2} + \frac{4}{x^3} + \frac{1}{x^4}$ d) $x^5 - 10x^2 + \frac{40}{x} - \frac{80}{x^4} + \frac{80}{x^7} - \frac{32}{x^{10}}$