

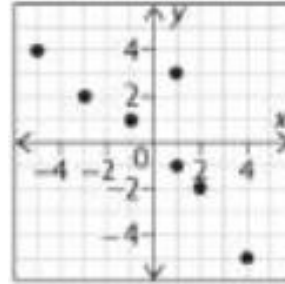
These review lessons should not be considered a comprehensive review of all topics. You should be reviewing ALL of your notes, quizzes, tests, and textbook to prepare for the exam/summative.

Unit I Review - Introduction to Functions

1. State which relations are functions. Explain.

a) $\{(-3, 2), (-4, 1), (0, 1), (2, 2), (6, 1)\}$

b)



2. Determine the domain and range of each function.

a) $f(x) = -0.25(x-4)^2 - 6$

b) $f(x) = \frac{1}{-(2-x)}$

3. Determine the inverse, $f^{-1}(x)$, of each function.

a) $f(x) = \frac{x-4}{5}$

b) $\{(-8, -5), (-6, 4), (3, 4), (4, 7), (6, -2)\}$

4. For $f(x) = -4x - 6$, evaluate $f(2a+3) - f(4-a)$.

5. The function $y = f(x)$ has been transformed to $y = af[k(x-d)] + c$. Determine the values of a , k , d , and c .

a) A vertical stretch of factor 4 and a translation of 2 units to the left are applied to $y = f(x)$.

b) A horizontal stretch of factor $\frac{1}{2}$, a reflection in the x -axis, and translations 1 unit to the right and 6 units down are applied to $y = f(x)$.

Unit II Review - Equivalent Algebraic Expressions

1. Factor.

a) $6x(2x-9) - 5(2x-9)$

b) $3mn + 9m + 2n + 6$

c) $35y^2 + 11y - 6$

d) $48t^2 + 22t - 15$

2. Simplify and state the restriction(s) on the variable. 3. Use factoring to determine the x -intercepts of $y = 6x^3 - 3x^2 - 8x + 4$.

a) $\frac{m(m-1)^2}{7m+49} \div \frac{m(m-1)}{m+7}$

4. Simplify and state the restriction(s) on the variable(s).

a) $\frac{14mn^3}{21m^4n^2}$

b) $\frac{6x+24}{x^2+8x+16}$

5. Simplify and state the restriction(s) on the variables.

$$\frac{6}{3x-2} - \frac{1}{8y+1}$$

Unit III Review - Quadratic Functions

1. Simplify each of the following.

a) $3\sqrt{2} \times 2\sqrt{32}$

b) $4\sqrt{8}(3\sqrt{5} + \sqrt{2})$

c) $\sqrt{10}(\sqrt{2} - \sqrt{5})$

d) $(2\sqrt{6})^4$

2. For what value(s) of k will the function $f(x) = 7x^2 + 3x + k$ have 2 real zeros.

3. Determine whether or not the inverse of each of the following functions is also a function.

a) The function $f(x) = 16(x-9)^2 + 14$ with a domain of $x \in R$.

4. Find the vertex by:

a) completing the square

b) partial factoring

$y = -2x^2 + 6x + 1$

$y = 3x^2 + 5x - 9$

ALSO: Word Problems/Max/Min problems etc

Unit IV Review - Exponential Functions

1. An antique dresser was worth \$560 in 1992. Each year, its value increased by 1.5%.

a) Write an equation that models the value of the dresser as a function of the year after 1992.

b) Determine the value of the dresser in 2000.

2. Simplify. Write your answer with positive exponents.

a) $\frac{m^{-4}n^{-6}}{(mn^2)^{-0.4}}$

b) $[(y^{-3})^5]^{\frac{2}{3}}$

3. Complete the table.

Exponential Form	Radical Form	Evaluation
$81^{\frac{3}{4}}$		
	$(\sqrt{121})^{-3}$	
$625^{0.25}$		

4. Evaluate. Express your answers in the form $\frac{a}{b}$.

a) $\left(\sqrt[4]{\frac{81}{625}}\right)^{-3}$

b) $\left(\frac{-2\sqrt[3]{-64}}{\sqrt{64}}\right)^{\frac{1}{2}}$

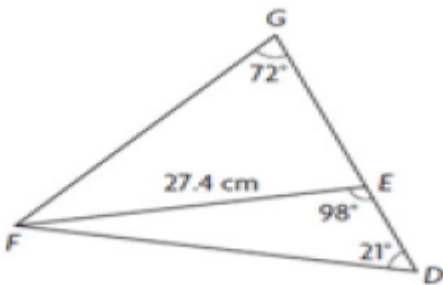
Unit V Review - Trigonometry

1. Given the following, determine all values of θ , to the nearest degree, if $0^\circ \leq \theta \leq 360^\circ$.

a) $\cot \theta = \frac{8}{5}$

b) $\sec \theta = -\frac{12}{5}$

2. For the triangle below, calculate the length of GF and DG to the nearest 10^{th} of a cm. Diagram not to scale.



3. Given the coordinates: $(-3, 7)$ on the terminal arm of angle θ .

i) State the value θ to the nearest degree if $0^\circ \leq \theta \leq 360^\circ$ and sketch the angle.

ii) Determine the value of r .

iv) State the reciprocal trig ratios of θ .

iii) State the primary trig ratios of θ .

v) Find the value of θ , correct to the nearest degree.

4. From one side of a river, David sees two trees on the opposite side. The distance from David to one tree is 55 m and from David to the other tree is 37 m. The angle between the two trees from David's perspective is 67° . How far apart are the trees, to the nearest metre?

Unit VI Review - Trigonometric Functions

1. Determine the equation of the trigonometric function whose graph has each of the following features.

a) An amplitude of 3.5, a period of 10° , an equation of the axis of $y = 4.5$, and a horizontal translation of 66° .

b) An amplitude of 8, a period of 1440° , an equation of the axis of $y = -9$, and a horizontal translation of -270° .

2. A hypnotist is swinging his pocket watch back and forth in front of a motion detector that has just been activated. The distance of the pocket watch from the detector in terms of time is modelled by the function $d(t) = 8\sin(180t + 60)^\circ + 20$, where t is time in seconds and $d(t)$ is the distance in cm.

a) What is the closest distance the watch gets to the motion detector?

b) How long does it take for the pocket watch to complete one full cycle of swinging back and forth?

c) What is the distance of the pocket watch from the motion detector at $t = 10.5$ s?

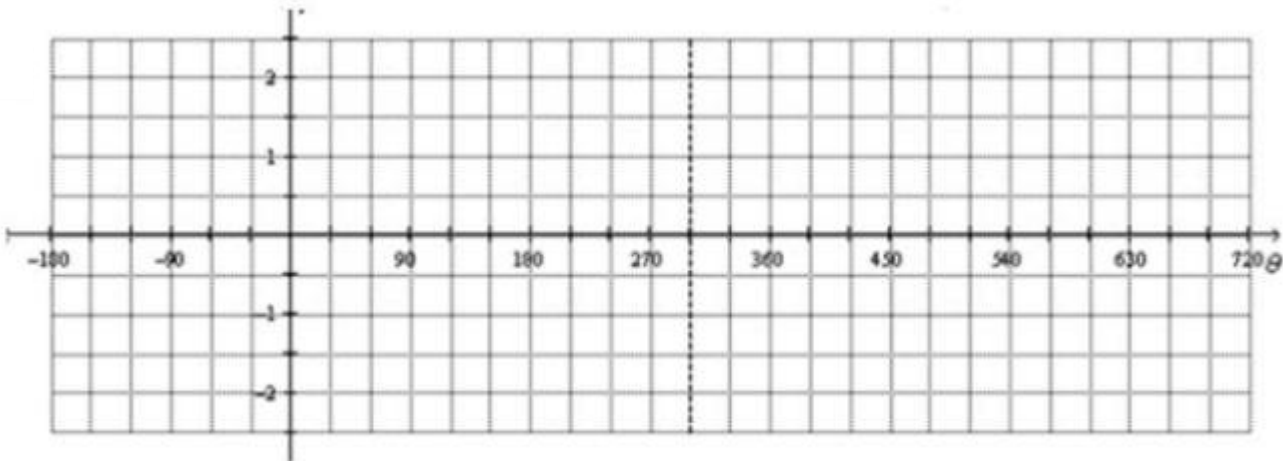
3. Prove.

a) $\frac{\sin^2 \theta + \cos^2 \theta}{\cot^2 \theta} = \tan^2 \theta$

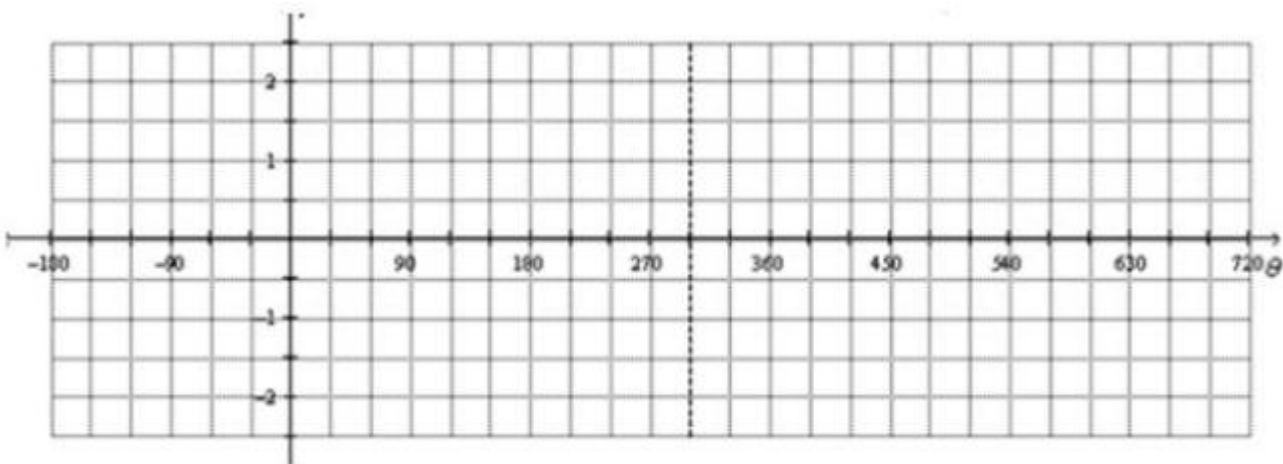
b) $\frac{1 + \tan^2 \theta}{1 + \cot^2 \theta} = \tan^2 \theta$

4. Sketch at least one complete cycle of the following.

a) $y = -\cos(\theta + 45^\circ) + 1$



b) $y = -2\sin\left(\frac{1}{2}\theta + 30^\circ\right)$



Unit VII Review - Discrete Functions - Sequences & Series and Financial Applications

1. State whether each of the following sequences is arithmetic, geometric or neither. If arithmetic or geometric, state the common ratio or difference.

a) 5, 18, 57, 174, 525 ...

b) $\frac{67}{100}, \frac{69}{100}, \frac{71}{100}, \frac{73}{100}, \frac{3}{4}, \dots$

c) $\frac{3}{5}, 6, 60, 600 \dots$

2. Determine the next three terms in each of the following sequences.

a) 17, 20, 15, 18, 13, 16, 11, ...

b) $\frac{1}{8}, \frac{1}{27}, \frac{1}{64}, \frac{1}{125}, \frac{1}{216}, \dots$

3. Find each of the following terms.

a) the 12th term of the sequence 13, 6, -1, -8, -15, ...

4. For each sequence, determine the total number of terms.

a) -18, -2, 14, 30, ..., 126

5. For each sequence, determine the total number of terms.

a) -8, 4, -2, 1, ..., $-\frac{1}{128}$

6. For each series, calculate:

a) $S_{12} = -5 - 11 - 17 - \dots$

7. Calculate the sum of the following series.

$$\frac{1}{6} + \frac{1}{18} + \frac{1}{54} + \dots + \frac{1}{1458}$$

8. Alan invests \$50 a month at 3%/a compounded monthly. How much will he have in 10 years?

9. Meena pays back a \$10000 loan with payments every 3 months over 3 years.

If she borrowed the money at 4%/a compounded quarterly, what is her regular payment?