Grade 11 Review (Canada)

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1. For each of the functions below state the,

   i) the parent function

   ii) the transformations performed

   iii) the domain

   iv) the range.

   a)
   $$3 \sqrt{x + 3} - 1$$

   b)
   $$f(x) = \frac{-4}{2x - 3} + 1$$

   c)
   $$f(x) = -2^{3x} + 4$$

   d)
   $$f(x) = 4\left(\frac{1}{3}\right)^{2x} - 2$$

   e)
   $$f(x) = (x - 1)^3 + 4$$

2. For functions below,

   i) find the y-intercept,

   ii) find the x-interceps,

   iii) find the vertex.

   iv) What is the axis of symmetry?

   v) Is the graph opening upwards or downwards?

   vi) What form is each quadratic in? (e.g. standard, vertex, factored)

   vii) Graph

   a) $f(x) = -x^2 + 2x + 3$ b) $g(x) = 3(x - 4)(x + 2)$

3. For each function in #2, rewrite in vertex form.

4. Simplify. (e.g. Rewrite each expressing with a single base.)

   a)
   $$6^{3x+4x^2}6^{-2c}6^{x^2}$$

   b)
   $$\left(\frac{1}{2}\right)^{m+4} 2^{4m-1}$$

   c)
   $$9^{x+2}3^{2x+1}$$

   d)
   $$\left(\frac{1}{5}\right)^{4-x} 25^{2x}125^{1-3x}$$

5. Find the exact values for the following trigonometric ratios.

a) $\cos 30°$

b) $\sin 45°$

c) $\csc 120°$

d) $\cot 240°$

e) $\sin 270°$

f) $\tan 60°$

g) $\sec 135°$

h) $\cos 315°$

i) $\tan 225°$

j) $\cos 270°$

6. Prove the following identities,

a)
$$\frac{\tan \theta}{\cos \theta} = \frac{\sin \theta}{1 - \sin^2 \theta}$$

b)
$$\cos^2 x = (1 - \sin x)(1 + \sin x)$$

c)
$$\frac{1}{\cos \theta} + \tan \theta = \frac{1 + \sin \theta}{\cos \theta}$$

d)
$$\sin^4 \theta - \cos^4 \theta = \sin^2 \theta - \cos^2 \theta$$

e)
$$\frac{\sin^2 \theta + 2\cos \theta - 1}{\sin^2 \theta + 3\cos \theta - 3} = \frac{\cos^2 \theta + \cos \theta}{- \sin^2 \theta}$$

7. For the following functions find the,

i) amplitude,

ii) equation of the axis,

iii) period.

iv) Graph the function.

a) $y = \sin x$

b) $y = -2 \sin x + 2$

c) $y = \sin(3x) - 1$

d) $y = \sin(x - 90)$

e) $y = \frac{1}{2} \sin(x - 45) + 3$

f) $y = -3 \sin \left(\frac{1}{2}(x + 60)\right) + 2$