Name MS. D May 25, 2016

CC Algebra 2

Module 1 and 2 Regents Review

REGENTS SAMPLER QUESTIONS

Exclusions: $x \neq 0, x \neq -7$

Like Denominators

1. What is the solution set of the equation $\frac{3x+25}{x(x+7)} - \frac{5}{x(x+7)} = \frac{3}{x}$?

$x(3x+25) - 5x(x+7) = 3(x+7)$

$3x^2 + 25x - 5x^2 - 35x = 3x + 21$

$-2x^2 - 10x = 3x + 21$

$0 = 2x^2 + 13x + 21$ $\quad ac = 42$

$2x^2 + 6x + 7x + 21$

$2x(x+3) + 7(x+3)$

$0 = (2x+7)(x+3)$

$x = -7/2$ | $x = -3$

2. Solve the following system of equations algebraically for all values of x, y, and z:

$$\begin{cases} x + 3y + 5z = 45 \\ 6x - 3y + 2z = -10 \\ -2x + 3y + 8z = 72 \end{cases}$$

$x + 3y + 5z = 45$

$+ \quad 6x - 3y + 2z = -10$

$7x + 7z = 35$

$6x - 3y + 2z = -10$

$+ \quad -2x + 3y + 8z = 72$

$4x + 10z = 62$

$4(7x + 7z = 35) \rightarrow 28x + 28z = 140$

$-7(4x + 10z = 62) \rightarrow -28x - 70z = -434$

$-42z = -294$

$z = 7$

$7x + 7z = 35$

$7x + 7(7) = 35$

$7x + 49 = 35$

$7x = -14$

$x = -2$

$x + 3y + 5z = 45$

$(-2) + 3y + 5(7) = 45$

$-2 + 3y + 35 = 45$

$3y + 33 = 45$

$3y = 12$

$y = 4$

Solution:

$x = -2$

$y = 4$

$z = 7$

3. If the terminal side of angle θ, in standard position, passes through point (–4,3), what is the numerical value of sin θ?

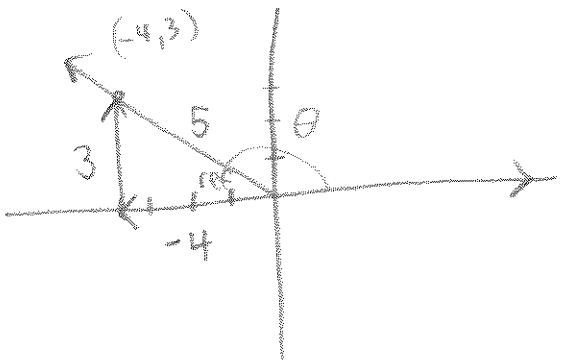
1

(1) $\frac{3}{5}$

(2) $\frac{4}{5}$

(3) $-\frac{3}{5}$

(4) $-\frac{4}{5}$



Unit Circle Point: Divide by Hyp. to Scale down to radius of 1

$(\frac{-4}{5}, \frac{3}{5})$

cosθ sinθ

4. Which statement is *incorrect* for the graph of the function $y = -3\cos\left[\frac{\pi}{3}(x-4)\right]+7$?

4

T (1) The period is 6.

T (2) The amplitude is 3.

T (3) The range is [4,10].

F (4) The midline is $y = -4$.

NOTES

$y = a\cos(bx) + d$

$|a|$ = amplitude

b = frequency

d = midline

period = $\frac{2\pi}{\text{freq.}}$

max = midline + amp

min = midline - amp

amp = 3

freq = $\frac{\pi}{3}$

period = $\frac{2\pi}{\pi/3} = \frac{2\pi}{1}\cdot\frac{3}{\pi} = 6$

midline = 7

max = 7+3 = 10

min = 7-3 = 4

range [4,10]

5. The ocean tides near Carter Beach follow a repeating pattern over time, with the amount of time between each low and high tide remaining relatively constant. On a certain day, low tide occurred at 8:30 a.m. and high tide occurred at 3:00 p.m. At high tide, the water level was 12 inches above the average local sea level; at low tide it was 12 inches below the average local sea level. Assume that high tide and low tide are the maximum and minimum water levels each day, respectively.

8:30 to 3 is 6.5 hours

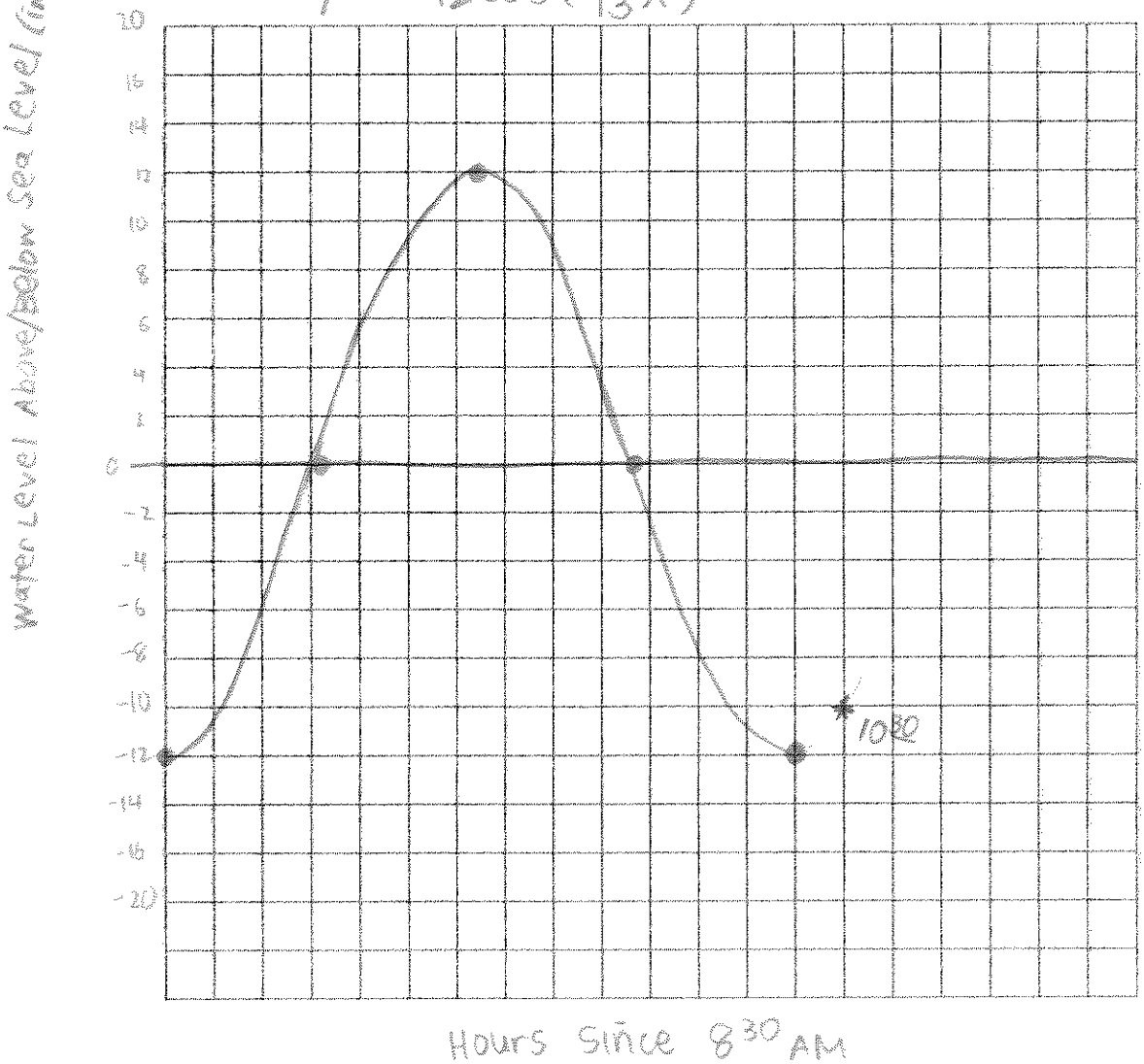
Write a cosine function of the form $f(t) = A\cos(Bt)$, where A and B are real numbers, that models the water level, $f(t)$, in inches above or below the average Carter Beach sea level, as a function of the time measured in t hours since 8:30 a.m.

period = $2(6.5) = 13$

Freq = $\frac{2\pi}{13}$

On the grid below, graph one cycle of this function.

$Y = -12\cos\left(\frac{2\pi}{13}X\right)$



Amp = 12

-cos because it starts at the min.

People who fish in Carter Beach know that a certain species of fish is most plentiful when the water level is increasing. Explain whether you would recommend fishing for this species at 7:30 p.m. or 10:30 p.m. using evidence from the given context.

↓ water decreasing

↑ increasing

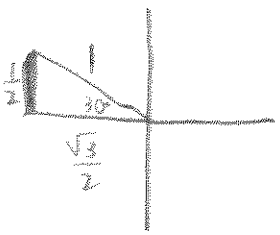
The water is increasing at 10:30 pm, so I'd recommend fishing then

Green Review Book Questions – Test 6

#4

$\sin\left(\frac{5\pi}{6}\right)$

$\frac{5(180^\circ)}{6} = 150^\circ$



CHOICE (1)

#15

Period $= 8\pi$ freq $= \frac{2\pi}{8\pi} = \frac{1}{4}$

midline $y = 3$

Amp of 2

$f(x) = a\sin(bx) + d$

$f(x) = 2\sin\left(\frac{1}{4}x\right) + 3$ CHOICE (4)

#25

$$\begin{cases} x - 2y + 3z = 7 & (1) \\ 2x + y + z = 4 & (2) \\ -3x + 2y - 2z = -10 & (3) \end{cases}$$

$-5(-2x + z = -3) \rightarrow 10x - 5z = 15$

$5x + 5z = 15 \rightarrow 5x + 5z = 15$

$15x = 30$

$x = 2$

(1)+(3)

$-2x + z = -3$

$2(2x + y + z = 4)$

$4x + 2y + 2z = 8$

$(1) + x - 2y + 3z = 7$

$5x + 5z = 15$

$5x + 5z = 15$

$5(2) + 5z = 15$

$10 + 5z = 15$

$z = 1$

Solutions

$x = 2$

$y = -1$

$z = 1$

(3) $2(2) + y + 1 = 4$

$4 + y + 1 = 4$

$y = -1$

#32

$f(x) = -85\cos\left(\frac{8\pi}{5}t\right) + 109$

period $= \frac{2\pi}{8\pi/5} = 2\pi \cdot \frac{5}{8\pi} = 1.25$

midline $= y = 109$

min $= 109 - 85 = 24$

max $= 109 + 85 = 194$

* For a Gymnastics High Bar

24 to 194 feet is too high

24 to 194 cm is too low

24 to 194 inches makes sense.

* Time is likely in seconds.