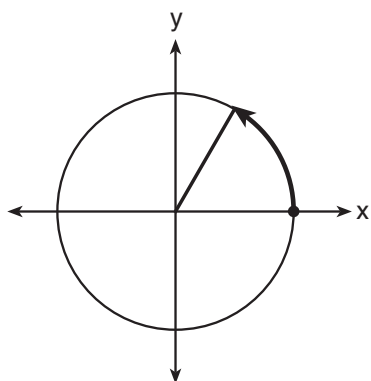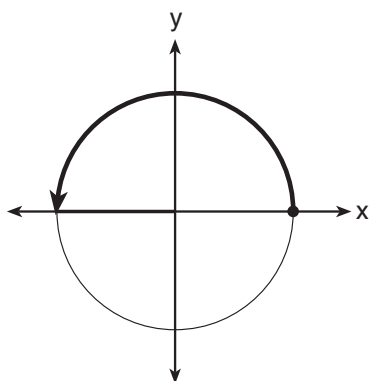**Homework: Trigonometry**
(These problems take some thought, but they are not necessarily difficult. Try them!)
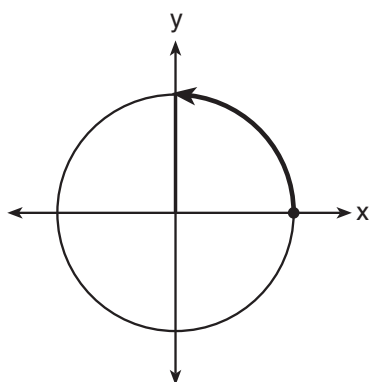
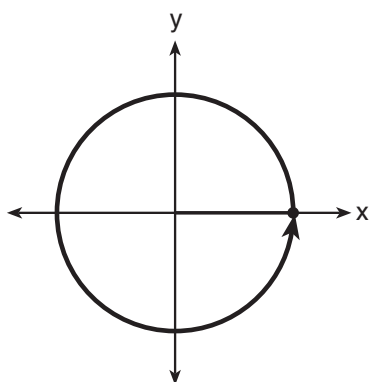**16** Which diagram shows an angle rotation of 1 radian on the unit circle?

(1)   (3)

(2)   (4)

17 A circle centered at the origin has a radius of 10 units. The terminal side of an angle, θ, intercepts the circle in Quadrant II at point C. The y-coordinate of point C is 8. What is the value of cos θ?
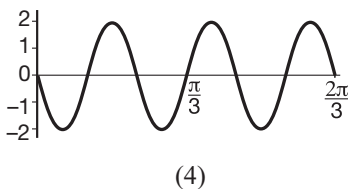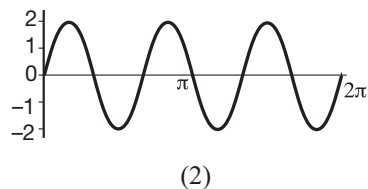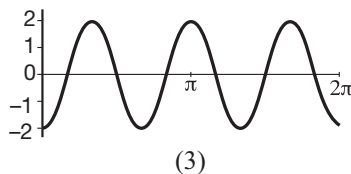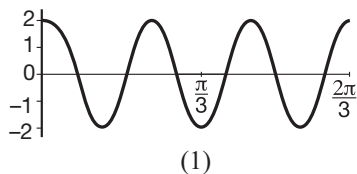
(1) $-\dfrac{3}{5}$ (3) $\dfrac{3}{5}$

(2) $-\dfrac{3}{4}$ (4) $\dfrac{4}{5}$

22 Which graph represents a cosine function with no horizontal shift, an amplitude of 2, and a period of $\frac{2\pi}{3}$?

$$\sum_{n=1}^{6} 8(1.10)^{n(+1}$$

$$\frac{8 - 8(1.10)^6}{0.90}$$

(2)

$$\sum_{n=1}^{6} 8(1.10)^n$$

$$8 - 8(0.10)^n$$

$$1.10$$

(4)

A sine function increasing through the origin can be used to model light waves. Violet light has a wavelength of 400 nanometers. Over which interval is the height of the wave *decreasing*, only?

(1) (0, 200)   (3) (200, 400)

(2) (100, 300)   (4) (300, 400)

27 Using the unit circle below, explain why $\csc\theta = \frac{1}{y}$.

$$\frac{x^3 + 2x^2 + x + 6}{x + 2}$$

$$\frac{4}{x + 2}$$

θ4

$x + 2$

(1,0)

(x,y)
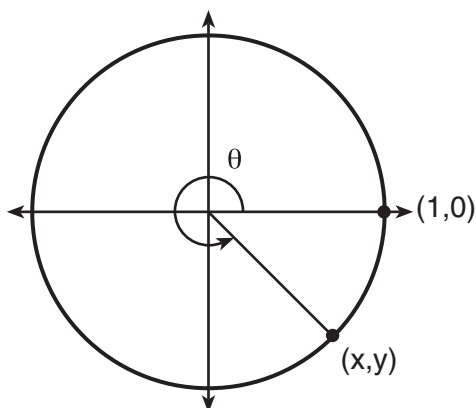
Note:
csc(x) = 1/sin(x)
sec(x) = 1/cos(x)
cot(x) = 1/tan(x)

20 There was a study done on oxygen consumption of snails as a function
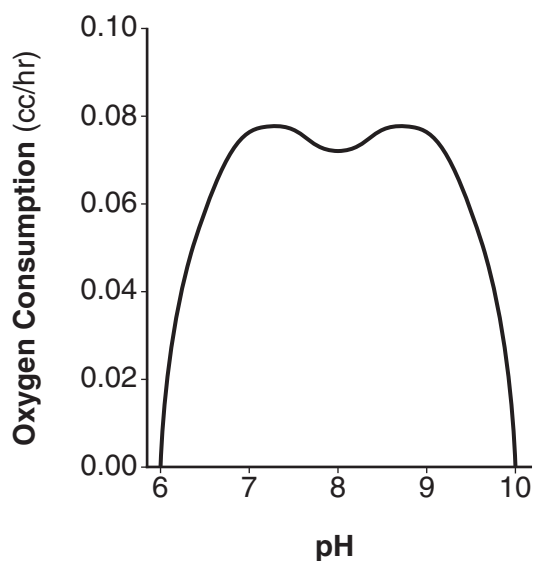of pH, and the result was a degree 4 polynomial function whose
graph is shown below.

Which statement about this function is *incorrect*?

(1) The degree of the polynomial is even.

(2) There is a positive leading coefficient.

(3) At two pH values, there is a relative maximum value.

(4) There are two intervals where the function is decreasing.

31 The results of a survey of the student body at Central High School about television viewing
preferences are shown below.

	Comedy Series	Drama Series	Reality Series	Total
Males	95	65	70	230
Females	80	70	110	260
Total	175	135	180	490

$(1.0525)^{\frac{12}{m}}$ $(1.00427)^{\frac{m}{12}}$

Are the events "student is a male" and "student prefers reality series" independent of each other?
Justify your answer.

36 Which function shown below has a greater average rate of change on the interval $[-2, 4]$? Justify
your answer.

x	f(x)
−4	0.3125
−3	0.625
−2	1.25
−1	2.5
0	5
1	10
2	20
3	40
4	80
5	160
6	320

$g(x) = 4x^3 - 5x^2 + 3$

7 The set of data in the table below shows the results of a survey on the
number of messages that people of different ages text on their cell
phones each month.

Age Group	Text Messages per Month		
	0–10	11–50	Over 50
15–18	4	37	68
19–22	6	25	87
23–60	25	47	157

If a person from this survey is selected at random, what is the
probability that the person texts over 50 messages per month given
that the person is between the ages of 23 and 60?

(1) $\dfrac{157}{229}$ (3) $\dfrac{157}{384}$

(2) $\dfrac{157}{312}$ (4) $\dfrac{157}{456}$

$\dfrac{1}{2}$