

MA 341 – Review Assignment 5

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Question 1

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Evaluate the indefinite integral.

$$\int \frac{x}{1+x^4} dx$$

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Question 2

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Evaluate the integral.

$$\int e^{-\theta} \cos(2\theta) d\theta$$

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Question 3

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Find the exact value of this expression.

$$\sin 20^\circ \cos 10^\circ + \cos 20^\circ \sin 10^\circ$$

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Question 4

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Find the exact value of this expression.

$$\cos 70^\circ \cos 20^\circ - \sin 70^\circ \sin 20^\circ$$

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### Question 5

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The monthly cost of driving a car depends on the number of miles driven. Lynn found that in May it cost her \$380 to drive 480 miles, and in June it cost her \$460 to drive 800 miles.

- (a) Express the monthly cost  $C$  as a function of the distance driven  $d$ , assuming that a linear relationship gives a suitable model.
- (b) Use part (a) to predict the cost of driving 1,550 miles in a month.
- (c) Draw the graph of the linear function. What does the slope of the graph represent?
- (d) What does the  $y$ -intercept of the graph represent?
- (e) Why does a linear function give a suitable model of this situation?

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### Question 6

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Explain how the following graphs are obtained from the graph of  $y = f(x)$ .

- (a)  $y = 7f(x)$
- (b)  $y = f(x - 6)$
- (c)  $y = -f(x)$
- (d)  $y = -8f(x)$
- (e)  $y = f(7x)$
- (f)  $y = 9f(x) - 7$

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**Question 7**

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Consider the following functions.

$$f(x) = \sqrt{2x+3}$$

$$g(x) = x^2 + 1$$

- (a) Find the function  $f \circ g$  and its domain.
- (b) Find the function  $g \circ f$  and its domain.
- (c) Find the function  $f \circ f$  and its domain.
- (d) Find the function  $g \circ g$  and its domain.

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**Question 8**

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Starting with the graph of  $y = e^x$  for each, write the equation of the graph which results from the following changes.

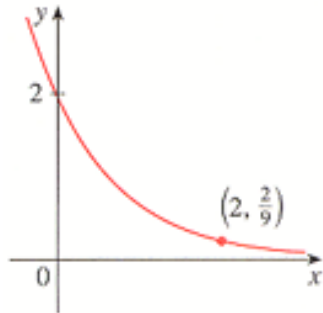
- (a) shifting 8 units downward
- (b) shifting 5 units to the right
- (c) reflecting about the  $x$ -axis
- (d) reflecting about the  $y$ -axis
- (e) reflecting about the  $x$ -axis and then about the  $y$ -axis

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**Question 9**

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Find the exponential function  $f(x) = Ca^x$  whose graph is given below.



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**Question 10**

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Write the partial fraction decomposition of the following rational expression.

$$\frac{7}{x(x-1)}$$