

MA 341 – Review Assignment 5 (answer key)

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Question 1

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$$\frac{1}{2} \tan^{-1}(x^2) + C$$

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Question 2

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$$\frac{2}{5} e^{-\theta} \sin 2\theta - \frac{1}{5} e^{-\theta} \cos 2\theta + C$$

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Question 3

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$$\frac{1}{2}$$

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Question 4

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$$0$$

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Question 5

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- (a)  $C(d) = \frac{1}{4}d + 260$
- (b) \$648
- (c) the cost in dollars per mile
- (d) the fixed cost (amount she pays even if she does not drive)
- (e) A linear function gives a suitable model in this situation because you have fixed monthly costs such as insurance and car payments, as well as costs that increase as you drive, such as gasoline, oil, and tires, and the cost of these for each additional mile driven is a constant.

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Question 6

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- (a) stretch the graph vertically by a factor of 7
- (b) shift 6 units to the right
- (c) reflect about the  $x$ -axis
- (d) stretch the graph vertically by a factor of 8 and reflect about the  $x$ -axis
- (e) shrink the graph horizontally by a factor of 7
- (f) shift 7 units downward and stretch the graph vertically by a factor of 9

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Question 7

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(a)  $f \circ g = \sqrt{2(x^2 + 1) + 3}$ ; domain = all real numbers

(b)  $g \circ f = (\sqrt{2x + 3})^2 + 1$ ; domain =  $[-3/2, \infty)$

(c)  $f \circ f = \sqrt{2\sqrt{2x + 3} + 3}$ ; domain =  $[-3/2, \infty)$

(d)  $g \circ g = (x^2 + 1)^2 + 1$ ; domain = all real numbers

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Question 8

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(a)  $y = e^x - 8$

(b)  $y = e^{x-5}$

(c)  $y = -e^x$

(d)  $y = e^{-x}$

(e)  $y = -e^{-x}$

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Question 9

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

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Question 10

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$\frac{-7}{x} + \frac{7}{x-1}$