

ALGEBRA AND TRIGONOMETRY FOR COLLEGE READINESS

Chapter 5 Form B

NAME _____

1. Match the expression in Column I with its equivalent expression from Column II. Choices may be used once, more than once, or not at all.

Column I	Column II	
$\frac{1}{(-5)^2}$ a. $(-5)^{-2}$	A. $\frac{3}{5}$	1. a. <u>H</u>
b. -5^2	B. -1	b. <u>C</u>
c. 5^0	C. -25	c. <u>E</u>
d. -5^0	D. $\frac{1}{8}$	d. <u>B</u>
$\frac{1}{5} + \frac{1}{3}$ e. $5^{-1} + 3^{-1}$	E. 1	e. <u>F</u>
f. $(5+3)^{-1}$	F. $\frac{8}{15}$	f. <u>D</u>
g. $(-5)^0$	G. $\frac{2}{3}$	g. <u>E</u>
h. 5^{-2}	H. $\frac{1}{25}$	h. <u>H</u>
i. $\frac{5^{-1}}{3^{-1}}$	I. None of these	i. <u>A</u>

For Exercises 2–4, simplify. Write answers with only positive exponents. Assume all variables represent nonzero real numbers.

2. $\left(\frac{3}{4}\right)^{-3} \left(\frac{3}{4}\right)^{-1} \left(\frac{3}{4}\right)^6$ $\left(\frac{3}{4}\right)^2$ 2. $\frac{9}{16}$
3. $\frac{3^{-2}r^{-3}}{2(r^{-3})^4}$ 3. $\frac{r^9}{18}$
4. $(-5c^{-3}d^2)^0 (7c^{-3}d^{-8})^3$ 4. $c^9 d^{24}$

5. Write 4.73×10^{-3} in standard form.

5. 0.00473

6. Use scientific notation to evaluate

$$\frac{(72,000)(0.0056)}{(0.0008)(360)} = \frac{(7.2 \times 10^4)(5.6 \times 10^{-3})}{(8 \times 10^{-4})(3.6 \times 10^2)} = \frac{40.32 \times 10^1}{28.8 \times 10^{-2}} = 1.4 \times 10^3$$

6. 1.4×10^3 1400

7. Let $P(x) = 2x^2 - 4x + 4$; find $P(-4)$.

$$2(-4)^2 - 4(-4) + 4$$

$$32 + 16 + 4$$

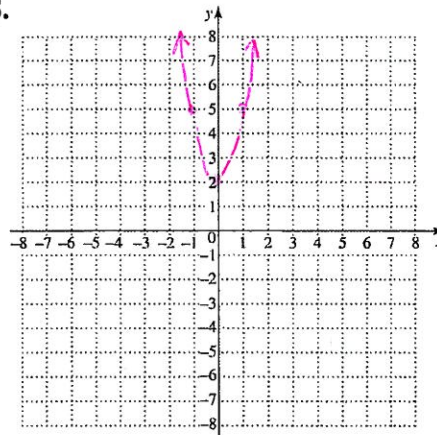
7. 52

8. Graph the function defined by

$$f(x) = 3x^2 + 2$$

x	y
-2	14
-1	5
0	2
1	5
2	14

8.

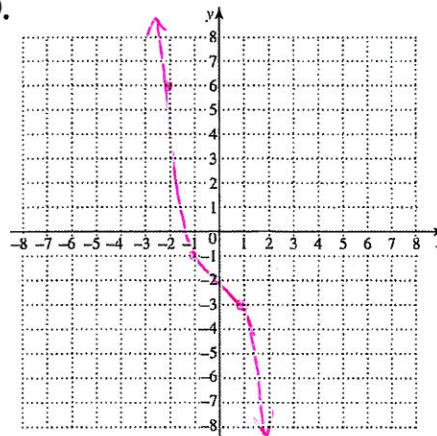


9. Graph the function defined by

$$y = -x^3 - 2$$

x	y
-2	6
-1	-1
0	-2
1	-3
2	-10

9.



10. The number of applicants (in thousands) to United States medical schools from 1996–2007 can be modeled by the polynomial function defined by $f(x) = .007x^3 + 0.208x^2 - 3.55x + 46.9$, where $x = 0$ corresponds to 1996, $x = 1$ corresponds to 1997, and so on. Use this model to approximate the number of applicants in 2000. (Source: based on data from www.aamc.org/data/facts/2007/2007summary2.htm.)

10. 36.476 thousand
 $x = 4$
 $0.007(4)^3 + 0.208(4)^2 - 3.55(4) + 46.9$

11. The unemployment rate in a certain community can be modeled by the equation $y = 0.0248x^2 - 0.4810x + 7.8543$, where y is the unemployment rate (percent) and x is the month ($x = 1$ represents January, $x = 2$ represents February, etc.) Use the model to find the unemployment rate in October. Round your answer to the nearest tenth.

11. 5.5243 5.5%
 $x = 10$
 $0.0248(10)^2 - 0.4810(10) + 7.8543$

For Exercises 10–17, perform the indicated operation.

12. $(3x^3 - 2x^2 + 8x - 2) - (4x^3 - x + 9) + (5x^2 - 7x)$

12. $-x^3 + 3x^2 + 2x - 11$

13. $(3x - 2)(5x + 8)$

13. $15x^2 + 14x - 16$

14. $(2a - 3)(a^2 + 7a - 2)$

14. $2a^3 + 11a^2 - 25a + 6$

15. $(8r - 3s)^2$

15. $64r^2 - 48rs + 9s^2$

16. $(2x - 5y)(2x + 5y)$

16. $4x^2 - 25y^2$

17. $[2a + (5b - 3)][2a - (5b - 3)]$

17. $4a^2 - 25b^2 + 30b - 9$

18. $\frac{5x^4 - 10xy^3 - 15x + 25}{-5x^2}$

18. $-x^2 + \frac{2y^3}{x} + \frac{3}{x} - \frac{5}{x^2}$

19. $\frac{2v^2 - 11v + 16}{2v + 3}$

$$\begin{array}{r} v-7 \\ 2v+3 \overline{) 2v^2-11v+16} \\ \underline{-2v^2+3v} \\ -14v+16 \\ \underline{+14v+21} \\ 37 \end{array}$$

19. $v-7 + \frac{37}{2v+3}$

For Exercises 18–20, $f(x) = x^2 + 3x - 2$ and $g(x) = x - 2$

20. a. $(f \circ g)(x)$

20. a. $x^2 - x - 4$

b. $(f \circ g)(-3)$

b. 8

21. a. $(fg)(x)$

21. a. $x^3 + x^2 - 8x + 4$

b. $(fg)(-2)$

b. 16

22. a. $\left(\frac{f}{g}\right)(x)$

$$\begin{array}{r} 1 \ 3 \ -2 \\ 2 \overline{) 1 \ 3 \ -2} \\ \underline{2 \ 2 \ 0} \\ 1 \ 1 \ 0 \end{array}$$

22. a. $\frac{x^2 + 3x - 2}{x - 2} = x + 1$

b. $\left(\frac{f}{g}\right)(-1)$

b. $\frac{4}{3}$

For Exercises 23–25, $f(x) = 3x^2 - x - 2$ and $g(x) = 3x + 2$

23. a. $(f \circ g)(x)$

23. a. $27x^2 + 33x + 8$

b. $(f \circ g)(-1)$

b. 2

24. a. $(fg)(x)$

24. a. $9x^3 + 3x^2 - 8x - 4$

b. $(fg)(-1)$

b. -2

25. a. $\left(\frac{f}{g}\right)(x)$

$$\begin{array}{r} x-1 \\ 3x+2 \overline{) 3x^2-x-2} \\ \underline{-3x^2+2x} \\ -3x-2 \\ \underline{+3x+2} \\ 0 \end{array}$$

25. a. $\frac{3x^2 - x - 2}{3x + 2} = x - 1$

b. $\left(\frac{f}{g}\right)(-1)$

b. -2