

2.1-2.3 Quiz Review  
Algebra 2 with Trigonometry

Simplify the expression.

$$1. (-3a^2b^3)^4 (2ab)^3$$

$$(-3)^4 (a^2)^4 (b^3)^4 (2)^3 (a)^3 (b)^3$$

$$81 \cdot a^8 \cdot b^{12} \cdot 8 \cdot a^3 \cdot b^3$$

$$\boxed{648a^{11}b^{15}}$$

$$2. (a^3b^{-4})(a^2b^3)^4$$

$$a^3b^{-4} \cdot a^8b^{12}$$

$$\boxed{a^{11}b^8}$$

$$3. \frac{10x^3y^2}{14xy^2} \cdot \frac{8x^5y^3}{3xy^3}$$

$$\frac{20x^8y^2}{3x^2y^5} = \boxed{\frac{20x^6}{3y^3}}$$

$$4. \frac{28x^2y^5}{38x^2y} \cdot \frac{7x^5y^3}{4x^{-2}y}$$

$$= \frac{2x^7y^8}{3y^2}$$

$$= \boxed{\frac{2x^7y^6}{3}}$$

$$5. \left( \frac{12x^6y^8}{13x^9y^2} \right)^{-2}$$

$$\left( \frac{12y^6}{13x^3} \right)^{-2} = \left( \frac{13x^3}{12y^6} \right)^2$$

$$= \boxed{\frac{169x^6}{144y^{12}}}$$

$$6. \left( \frac{10x^5}{7} \right)^{-5}$$

$$(10)^{-5} = \frac{1}{10^5} = \boxed{\frac{1}{100000}}$$

$$7. \frac{2x^{17}}{x^{10}} \cdot \frac{1}{5}$$

$$\boxed{\frac{2x^7}{5}}$$

$$8. \frac{4xy^{11}}{x^7y^6} \cdot \frac{3x^8y}{8x^3}$$

$$= \frac{3x^9y^{12}}{x^{10}y^6}$$

$$= \boxed{\frac{3y^6}{x}}$$

9. Use direct substitution to evaluate:

$$f(x) = 4x^3 - 2x^2 + 5x - 10 \text{ when } x = 2$$

$$f(2) = 4(2)^3 - 2(2)^2 + 5(2) - 10$$

$$f(2) = 24$$

10. Use synthetic substitution to evaluate

$$f(x) = 2x^3 + 3x^2 + x - 6 \text{ when } x = 5$$

$$\begin{array}{r|rrrr} 5 & 2 & 3 & 1 & -6 \\ & \downarrow & 10 & 65 & 330 \\ \hline & 2 & 13 & 66 & 324 \end{array}$$

$$f(5) = 324$$

11. Use direct substitution to evaluate:

$$f(x) = -3x^4 - 3x^3 + 2x - 1 \text{ when } x = -3$$

$$f(-3) = -3(-3)^4 - 3(-3)^3 + 2(-3) - 1$$

$$f(-3) = -169$$

12. Use synthetic substitution to evaluate

$$f(x) = -x^4 + 2x^2 - 5x + 7 \text{ when } x = -2$$

$$\begin{array}{r|rrrrr} -2 & -1 & 0 & 2 & -5 & 7 \\ & \downarrow & 2 & -4 & 4 & 2 \\ \hline & -1 & 2 & -2 & -1 & 9 \end{array}$$

$$f(-2) = 9$$

13. Use direct substitution to evaluate:

$$f(x) = -2x^6 + x^3 - 4x^2 + 3 \text{ when } x = -3$$

$$f(-3) = -2(-3)^6 + (-3)^3 - 4(-3)^2 + 3$$

$$f(-3) = -1518$$

14. Use synthetic substitution to evaluate

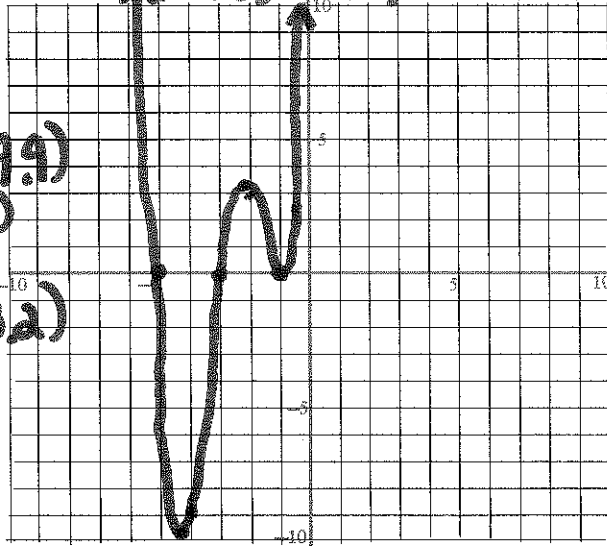
$$f(x) = x^3 + 9x^2 - 7x - 4 \text{ when } x = 3$$

$$\begin{array}{r|rrrr} 3 & 1 & 9 & -7 & -4 \\ & \downarrow & 3 & 36 & 87 \\ \hline & 1 & 12 & 29 & 83 \end{array}$$

$$f(3) = 83$$

Graph the given function. Describe the end behavior of the graph. Calculate zeros, local minimums, local maximums, and a table of values.

15.  $f(x) = (x-2)(x-3)(x+1)(x+5)$   
 ~~$(x+3)(x+1)(x+5)(x+1)$~~

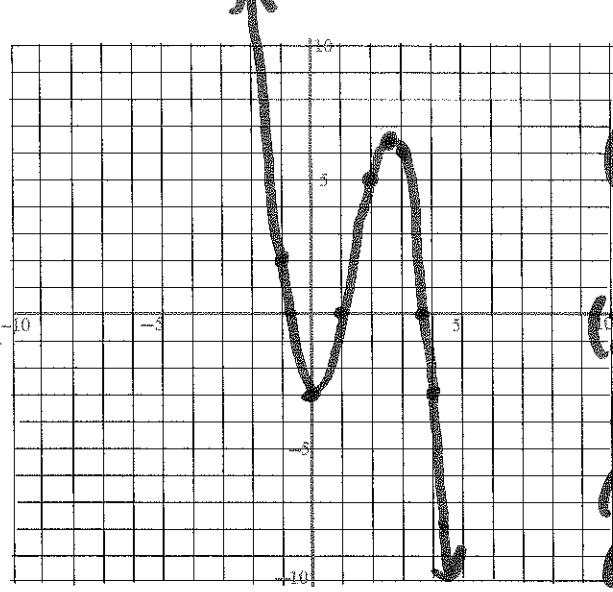


min  
 $(-1.3, 4.9)$   
 max  
 $(-2.2, 3.2)$   
 zeros  
 $(-5, 0)$   
 $(-1, 0)$   
 $(2, 0)$   
 $(3, 0)$

$f(x) \rightarrow +\infty$  as  $x \rightarrow -\infty$   
 $f(x) \rightarrow +\infty$  as  $x \rightarrow \infty$

same  
 EB  
 as:

16.  $f(x) = -x^3 + 4x^2 - 3$



min  
 $(0, -3)$   
 max  
 $(2.6, 6.5)$   
 zeros  
 $(-0.79, 0)$   
 $(1, 0)$   
 $(3.79, 0)$

$f(x) \rightarrow +\infty$  as  $x \rightarrow -\infty$   
 $f(x) \rightarrow -\infty$  as  $x \rightarrow \infty$

Use either  $+\infty$  or  $-\infty$  to complete the statement to describe the end behavior of the graph of the function.

17.  $f(x) = -2x^5 + 2x^2 - 5$

$f(x) \rightarrow +\infty$  as  $x \rightarrow -\infty$  and  $f(x) \rightarrow -\infty$  as  $x \rightarrow +\infty$

18.  $f(x) = x^2 - x + 12$

$f(x) \rightarrow +\infty$  as  $x \rightarrow -\infty$  and  $f(x) \rightarrow +\infty$  as  $x \rightarrow +\infty$

19.  $f(x) = -x^2 + 7x^3 + x$

$f(x) \rightarrow -\infty$  as  $x \rightarrow -\infty$  and  $f(x) \rightarrow -\infty$  as  $x \rightarrow +\infty$

True or False.

20. The polynomial function is a cubic trinomial with a degree of 3 and a leading coefficient of 6.

$y = 5 + 6x^3 - 2x$

true

21. The polynomial function is a quadratic binomial with a degree of 2 and a leading coefficient of 27.

$f(x) = 27x^2 - 2x^4$

false

Perform the indicated operation.

22.  $(2x^4 + 3x^2 - 3x) + (-4x^4 - 2x^3 + 5x^2 - 1)$

$-2x^4 - 2x^3 + 8x^2 - 3x - 1$

23.  $(5x^3 - 3x^2 + x - 5) - (2x^3 + 5x^2 - 5x + 1)$

$3x^3 - 8x^2 + 6x - 6$

24.  $(3x^3 + 5x^4 + 2x^2 + 4x) - (2x^4 - 3x^2 + 5)$

$3x^4 + 3x^3 + 5x^2 + 4x - 5$

25.  $(-3x^3 + 3 - 2x^2) + (4x^2 - 5x^3 + 3x - 5)$

$-8x^3 + 2x^2 + 3x - 2$

26.  $(3x^2 - 5x - 5)(2x + 3)$

	$3x^2$	$-5x$	$-5$
$2x$	$6x^3$	$-10x^2$	$-10x$
$3$	$9x^2$	$-15x$	$-15$

$6x^3 - x^2 - 25x - 15$

27.  $(4x - 1)^2$

$(4x - 1)(4x - 1)$   
 $16x^2 - 4x - 4x + 1$

$16x^2 - 8x + 1$

28.  $(2xy - 3)^3$

$(2xy - 3)(2xy - 3)(2xy - 3)$   
 $(4x^2y^2 - 12xy + 9)(2xy - 3)$

	$4x^2y^2$	$-12xy$	$9$
$2xy$	$8x^3y^3$	$-24x^2y^2$	$18xy$
$-3$	$-12x^2y^2$	$36xy$	$-27$

$8x^3y^3 - 36x^2y^2 + 54xy - 27$

29.  $(4x^4 - 2x^2 + 5)(x - 3)$

	$4x^4$	$-2x^2$	$5$
$x$	$4x^5$	$-2x^3$	$5x$
$-3$	$-12x^4$	$6x^2$	$-15$

$4x^5 - 12x^4 - 2x^3 + 6x^2 + 5x - 15$

30.  $(ab - c)(2ab + 7c)$

$2a^2b^2 + 7abc - 2abc - 7c^2$

$2a^2b^2 + 5abc - 7c^2$

31.  $(2x + 3)(x - 4)(3x + 1)$

$(2x^2 - 5x - 12)(3x + 1)$

	$2x^2$	$-5x$	$-12$
$3x$	$6x^3$	$-15x^2$	$-36x$
$1$	$2x^2$	$-5x$	$-12$

$6x^3 - 13x^2 - 41x - 12$