**Algebra 2 Practice Final 2017** SCORE \_\_\_\_\_\_\_\_\_\_\_\_\_\_

*(Chapters 5-6)*

**For Questions 1–2, simplify. Assume that no denominator equals 0.**

 **1.** $\sqrt{12}$ – $\sqrt{18}$ + 3$\sqrt{50}$ + $\sqrt{75}$

 **2.** $\frac{2 + i}{1- 3i}$

 **3.** Use synthetic division to find (2$x^{3}$ – 5$x^{2}$ + 7*x* – 1) ÷ (*x* – 1).

 **4.** Write the expression $m^{\frac{7}{9}}$ in radical form.

 **5.** Solve $\sqrt{3x + 6}$ + 4 ≤ 7.

 **6.** Find *p*(–3) if *p*(*x*) = $x^{5}$ + 3$x^{2}$.

 **7.** Solve $x^{4}$ + 200 = 102$x^{2}$.

 **8.** Use synthetic substitution to find *f*(–3) for *f*(*x*) = 2$x^{3}$ – 6$x^{2}$ – 5*x* + 7.

 **9.** One factor of *f*(*x*) = $x^{3}$ + $x^{2}$ – 22*x* – 40 is *x* + 4. Find the other factors.

**10.** List all of the possible rational zeros of *f*(*x*) = 3$x^{5}$ – 7$x^{3}$ + 2*x* – 15.

**11.** If *f*(*x*) = 3*x* and *g*(*x*) = 4*x* – 3, find *f* [*g*(5)] and *g*[ *f*(5)].

**12.** Find the inverse of *f*(*x*) = 7*x* – 2.

**13.** Simplify $\frac{4xy^{3}}{z^{2}}$ ÷ $\left(\frac{8x^{2}y}{z^{3}}\right)^{2}$.

**14.** Simplify $\frac{d}{ d^{2} - 9}$ + $\frac{5}{2d + 6}$.

**15.** Find the LCM of $m^{2}$ – 4*m* – 5 and $m^{2}$ + 8*m* + 7.

**1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**7. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**8. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**9. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**10. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**11. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**12. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**13. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**14. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**15. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Algebra 2 Practice Final 2017** *(continued)*

 *(Chapters 7-9)*

 **16.** Determine the equations of any vertical asymptotes and the value of *x* for any holes in the graph of *f*(*x*) = $\frac{x^{2}- 11 x + 18}{x – 2}$.

 **17.** If *y* varies jointly as *x* and *z* and *y* = 100 when *x* = 10 and *z* = 5, find *y*when *x* = 12 and *z* = 6.

 **18.** Solve $\frac{8 }{t + 5}$ = $\frac{t – 3 }{t + 5}$ + $\frac{1}{3}$.

 **19.** Sketch the graph of *y* = 1.5$(2)^{x}$. Then state the function’s domain and range.

 **20.** Determine whether *y* = 1.5 $\left(\frac{1}{6}\right)^{x}$represents exponential *growth* or *decay*.

**For Questions 21-25, solve each equation or inequality.
Round to four decimal places if necessary.**

**21.** $\left(\frac{1}{5}\right)^{t - 2}$= 125 **22.** $log\_{4}(x – 9)$ = 2

**23.** $log\_{4}z$ + $log\_{4}(z – 3)$ = 1

**24.** $3.9^{m - 4}$ = 10.21 **25.** $e^{3x}$≥ 21

**26.** Use $log\_{5}2$ ≈ 0.4307 and $log\_{5}3$ ≈ 0.6826 to approximate the value of $log\_{5}12$.

**27.** Express $log\_{6}19$ in terms of common logarithms. Then approximate its value to four decimal places.

**28.** In a certain area, the sale price of new single-family homes has increased 4.1% per year since 1992. If a house was purchased in this area in 1992 for $75,000 and the growth continues, what will the sale price be in 2010? Use

 *y* = *a*$(1+r)^{t}$and round to the nearest cent.

**16. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**17. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**18. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**19. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

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**20. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**21. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**22. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**23. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**24. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**25. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**26. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**27. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**28. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**