Name: KEY worked out solutions available at: fur.ly/96ai Practice

Chapter 5 Practice Test

Simplify the expression.

1. $\left(a^2b^2\right)^5 = a^{10}b^{10}$

2. $\left(-2a^2b^3c^4\right)^4 = (-2)^4 a^8 b^{12} c^{16} = 16a^8b^{12}c^{16}$

3. Use synthetic substitution to evaluate $f(s) = 6s^3 - 6s^2 - 2s + 2$ when $s = 2$.

$$2 \mid \begin{matrix} 6 & -6 & -2 & 2 \\ \downarrow & 12 & 12 & 20 \\ \hline 6 & 6 & 10 & 22 \end{matrix}$$

22 is the answer

Find the sum or difference.

4. $\left(8h^3 - 8h + 8\right) - \left(7h^3 + 7h + 1\right) = 8h^3 - 8h + 8 - 7h^3 - 7h - 1 = h^3 - 15h + 7$

5. $\left(9a^5 - 9a^4 + 1\right) + \left(6a^5 - 6a + 7\right) = 9a^5 - 9a^4 + 1 + 6a^5 - 6a + 7 = 15a^5 - 9a^4 - 6a + 8$

Find the product.

6. $(k-3)\left(k^2 + k + 2\right) = k^3 + k^2 + 2k - 3k^2 - 3k - 6$
$= k^3 - 2k^2 - k - 6$

Factor the polynomial completely.

7. $2b^3 - 4b^2 + 10b = 2b(b^2 - 2b + 5)$

Find the real-number solutions of the equation.

8. $v^3 - 2v^2 = 0$ $v^2(v-2) = 0$

$v^2 = 0$ $v - 2 = 0$

$v = 0$ $v = 2$

Given polynomial *f(x)* and a factor of *f(x)*, factor *f(x)* completely.

9. $f(x) = x^3 + 4x^2 + x - 6$ given that $(x+2)$ is a factor.

$$-2 \mid \begin{matrix} 1 & 4 & 1 & -6 \\ \downarrow & -2 & -4 & 6 \\ \hline 1 & 2 & -3 & 0 \end{matrix}$$

$x^2 + 2x - 3$

$f(x) = x^3 + 4x^2 + x - 6$
$= (x+2)(x^2 + 2x - 3)$
$= (x+2)(x+3)(x-1)$

10. $f(x) = 2x^3 - 15x^2 + 34x - 21$ given that $(x - 1)$ is a factor.

$f(x) = 2x^3 - 15x^2 + 34x - 21$

$= (x-1)(2x^2 - 13x + 21)$

$= (x-1)(2x-7)(x-3)$

$1 \mid 2 \quad -15 \quad 34 \quad -21$

$\quad\downarrow \quad 2 \quad -13 \quad 21$

$2 \quad -13 \quad 21 \quad 0$

$2x^2 - 13x + 21$

Given polynomial function *f* and a zero of *f*, find the other zeros.

11. $f(x) = x^3 + 8x^2 + 5x - 14$ given that -2 is one of the zeros.

$-2 \mid 1 \quad 8 \quad 5 \quad -14$

$\quad\downarrow \quad -2 \quad -12 \quad 14$

$1 \quad 6 \quad -7 \quad 0$

$x^2 + 6x - 7 = 0$

$(x+7)(x-1) = 0$

$x+7=0 \quad x-1=0$

$x=-7 \quad x=1$

List the possible rational zeros of the function using the rational zeros theorem.

12. $f(x) = 2x^3 + 3x^2 - 11x - 6$

$\frac{\text{Factors of } -6}{\text{Factors of } 2} = \frac{\pm 1, \pm 2, \pm 3, \pm 6}{\pm 1, \pm 2} = \pm 1, \pm 2, \pm 3, \pm 6, \pm \frac{1}{2}, \pm \frac{3}{2}$

Find all real zeros of the function.

13. $p(x) = 2x^3 + 20x^2 + 62x + 60 = 2(x^3 + 10x^2 + 31x + 30)$

Possible Rational Zeros: $\pm 1, \pm 2, \pm 3, \pm 5, \pm 6, \pm 10, \pm 15, \pm 30$

Test $x=1$

$1 \mid 1 \quad 10 \quad 31 \quad 30$

$\quad\quad 1 \quad 11 \quad 42$

$1 \quad 11 \quad 42 \quad 72$ NO.

Test $x=-1$

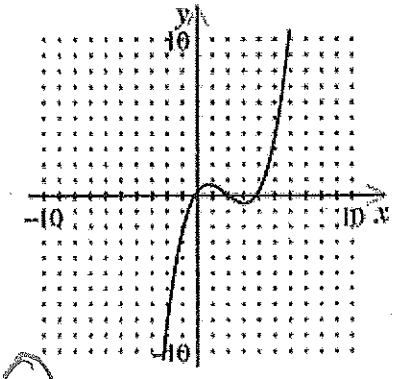
$-1 \mid 1 \quad 10 \quad 31 \quad 30$

$\quad\quad -1 \quad -9 \quad -22$

$1 \quad 9 \quad 22 \quad 8$ No.

See below #14 for the rest.

____ 14. Use the graph to approximate the real zeros of the function. Round to the nearest integer.



Look for the x-intercepts.

a. 0, 2, 4 b. –4, –2, 0 c. 2, –4, –2, 0 d. 2

#13, (cont.)

Test $x=2$

$2 \mid 1 \quad 10 \quad 31 \quad 30$

$\quad\quad 2 \quad 24 \quad 110$

$1 \quad 12 \quad 55 \quad 140$

No.

Test $x=-2$

$-2 \mid 1 \quad 10 \quad 31 \quad 30$

$\quad\quad -2 \quad -16 \quad -30$

$1 \quad 8 \quad 15 \quad 0$

Yes! $(x^2 + 8x + 15)$

$p(x) = 2(x^3 + 10x^2 + 31x + 30)$

$= 2(x+2)(x^2 + 8x + 15)$

$= 2(x+2)(x+3)(x+5)$

$0 = 2(x+2)(x+3)(x+5)$

$x+2=0 \quad x+3=0 \quad x+5=0$

$x=-2 \quad x=-3 \quad x=-5$