Test #2 Review Questions (Sections 4.1, 4.2, 4.4, 5.1-5.5, 5.8, 7.1-7.4, 8.1-8.2, 8.4)

Notes:

1. *Answers, with limited or no work, can be found on the last page.*
2. *Links to video solutions to these questions can be found in the Test #3 Review Page in Canvas.*
3. *The questions are numbered according to the corresponding questions in the Chapter 5, Chapter 7 and Chapter 8 Tests at the end of each chapter in the eText.*

Chapter 4 Questions

Ch4 Test #2

Solve and graph. Write the solution set using both set-builder notation and interval notation.

$-\frac{1}{2}t < 12$

Ch4 Test #3

Solve and graph. Write the solution set using both set-builder notation and interval notation.

$-4y - 3 \geq 5$

Ch4 Test #4

Solve and graph. Write the solution set using both set-builder notation and interval notation.

$3a - 5 \leq -2a + 6$

Ch4 Test #6

Solve and graph. Write the solution set using both set-builder notation and interval notation.

$-2(3x - 1) - 5 \geq 6x - 4(3 - x)$

Ch4 Test #7

Let $f(x) = -5x - 1$ and $g(x) = -9x + 3$. Find all values of x for which $f(x) > g(x)$

Ch4 Test #8

Dani can rent a van for either \$80 with unlimited mileage or \$45 with 100 free miles and an extra charge of 40¢ for each mile over 100. For what numbers of miles traveled would the unlimited mileage plan save Dani money?

Ch4 Test #9

A refrigeration repair company charges \$80 for the first half-hour of work and \$60 for each additional hour. Blue Mountain Camp has budgeted \$200 to re-pair its walk-in cooler. For what lengths of a service call will the budget not be exceeded?

Ch4 Test #10

Find the intersection: $\{a, e, i, o, u\} \cap \{a, b, c, d, e\}$.

Ch4 Test #11

Find the union: $\{a, e, i, o, u\} \cup \{a, b, c, d, e\}$.

Ch4 Test #12

For f(x) as given, use interval notation to write the domain of $f(x) = \sqrt{6 - 3x}$

Ch4 Test #14

Solve and graph the solution set.

$-5 < 4x + 1 \leq 3$

Ch4 Test #15

Solve and graph the solution set.

$3x - 2 < 7$ or $x - 2 > 4$

Ch4 Test #16

Solve and graph the solution set.

$-3x > 12$ or $4x \geq -10$

Ch4 Test #17

Solve and graph the solution set.

$1 \leq 3 - 2x \leq 9$

Ch4 Test #23

Let $g(x) = 4 - 2x$. Find all values of x for which $g(x) < -3$ or $g(x) > 3$.

Ch4 Test #25

Graph $y \leq 2x + 1$ on a plane.

Ch4 Test #26

Graph each system of inequalities. Find the coordinates of any vertices formed.

$x + y \geq 3$
$x - y \geq 5$

Chapter 5 Questions

Ch5 Test #4

Given $P(x) = 2x^3 + 3x^2 - x + 4$ find $P(0)$ and $P(-2)$.

Ch5 Test #5

Given $P(x) = x^2 - 3x$, find and simplify $P(a + h) - P(a)$.

Ch5 Test#7

Add $(-4y^3 + 6y^2 - y) + (3y^3 - 9y - 7)$

Ch5 Test#8

Add $(2m^3 - 4m^2n - 5n^2) + (8m^3 - 3mn^2 + 6n^2)$

Ch5 Test#9

Subtract $(8a - 4b) - (3a + 4b)$

Ch5 Test#10

Subtract $(9y^2 - 2y - 5y^3) - (4y^2 - 2y - 6y^3)$

Ch5 Test#11

Multiply $(-4x^2y^3)(-16xy^5)$

Ch5 Test#12

Multiply $(6a - 5b)(2a + b)$

$= 6a(2a+b) - 5b(2a+b)$

$= (6a)(2a) + (6a)(b) + (-5b)(2a) + (-5b)(b)$

$= 12a^2 + 6ab - 10ab - 5b^2$

$= 12a^2 - 4ab - 5b^2$

Ch5 Test#14

Multiply $(4t - 3)^2$

$(a-b)^2 = a^2 - 2ab + b^2$

$= (4t)^2 - 2(4t)(3) + (3)^2$

$= 16t^2 - 24t + 9$

Ch5 Test#16

Multiply $(x - 2y)(x + 2y)$

$(a-b)(a+b) = a^2 - b^2$

$= (x)^2 - (2y)^2$

$= x^2 - 4y^2$

Ch5 Test #17

Factor $x^2 - 10x + 25$ $\longrightarrow$ $x^2 + 5^2 - 2 \times x \times 5 = (x-5)^2$

$a^2 - 2ab + b^2 = (a-b)^2$

Ch5 Test #18

Factor $y^3 + 5y^2 - 4y - 20$

$= y^2(y+5) - 4(y+5) = (y^2-4)(y+5)$

$y^2 - 8y + 12$

$= (y^2 - 2^2)(y+5)$

$= (y-2)(y+2)(y+5)$

Ch5 Test #19

Factor $p^2 - 12p - 28$

Ch5 Test #20

Factor $t^7 - 3t^5$

$(x^2+4x-4xy-7)+(-4x^2-x+4y^2+4)$

$x^2+4x-4xy-7-4x^2-x+4y^2+4$

$x^2-4x^2+4x-x-4xy+4y^2-7+4$

$-3x^2+3x-4xy+4y^2-3$

$-3x^2-4xy+4y^2+3x-3$

Ch5 Test #21

Factor $12m^2 + 20m + 3$

Ch5 Test #22

Factor $9y^2 - 25$

Ch5 Test #24

Factor $45x^2 + 20 + 60x$

Ch5 Test #25

Factor $3x^4 - 48y^4$

Ch5 Test #27

Factor $x^2 + 3x + 6$

Ch5 Test #28

Factor $20a^2 - 5b^2$

Ch5 Test #29

Factor $24x^2 - 46x + 10$

Ch5 Test #31

Solve $x^2 - 3x - 18 = 0$

Ch5 Test #32

Solve $5t^2 = 125$

Ch5 Test #33

Solve $2x^2 + 21 = -17$

Ch5 Test #34

Solve $9x^2 + 3x = 0$

Ch5 Test #35

Solve $x^2 + 81 = 18x$

Ch5 Test #36

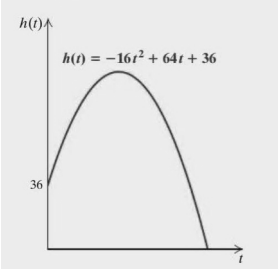
Let $f(x) = 3x^2 - 15x + 11$. Find a such that $f(a) = 11$

Ch5 Test #38

A photograph is 3 cm longer than it is wide. Its area is $40\ \text{cm}^2$. Find its length and width.

Ch5 Test #39

To celebrate Ripton's bicentennial fireworks are launched off a dam 36 ft above Lake Marley. The height of a display t seconds after it has been launched is given by $h(t) = -16t^2 + 64t + 36$. After how long will the shell from the fireworks reach the water?



Ch5 Test #40

The foot of an extension ladder is 10 ft from the wall. The ladder is 2 ft longer than the height that it reaches on the wall. How far up the wall does the ladder reach?

Ch7 Test #1

Simplify $\sqrt{50}$

Ch7 Test #3

Simplify $\sqrt{81a^2}$

Ch7 Test #5

Write an equivalent expression using exponential notation: $\sqrt{7xy}$

$(7xy)^{1/2} = 7^{1/2} x^{1/2} y^{1/2}$

Ch7 Test #6

Write an equivalent expression using radical notation: $(4a^3b)^{\frac{5}{6}}$

$(4a^3b)^{5/6} = (4a^3b)^{5 \times \frac{1}{6}} = \left[(4a^3b)^5\right]^{1/6} = \sqrt[6]{(4a^3b)^5}$

$(4a^3b)^{1/6 \times 5} = \left[(4a^3b)^{1/6}\right]^5 = \left(\sqrt[6]{4a^3b}\right)^5$

Ch7 Test #7

If $f(x) = \sqrt{2x - 10}$, determine the domain of f.

Ch7 Test #13

Simplify $\sqrt[4]{x^3}\sqrt{x}$ $= (x^3)^{\frac{1}{4}} \; x^{1/2} = x^{3/4} x^{1/2} = x^{\frac{3}{4}+\frac{1}{2}}$

$= x^{5/4} = x^{5 \times \frac{1}{4}} = (x^5)^{\frac{1}{4}}$

$\frac{3}{4} + \frac{1}{2} = \frac{3}{4} + \frac{2}{4}$

$= \frac{5}{4}$

$= \sqrt[4]{x^5}$

Ch7 Test #14

Simplify $\frac{\sqrt{y}}{\sqrt[10]{y}}$

$$\frac{\sqrt{y}}{\sqrt[10]{y}} = \frac{y^{1/2}}{y^{1/10}} = y^{\frac{1}{2}-\frac{1}{10}} = y^{\frac{5}{10}-\frac{1}{10}} = y^{\frac{4}{10}} = y^{\frac{2}{5}} = (y^2)^{\frac{1}{5}} = \sqrt[5]{y^2}$$

Ch7 Test #18

Rationalize the denominator: $\frac{\sqrt[3]{x}}{\sqrt[3]{4y}}$

$$\frac{\sqrt[3]{x}}{\sqrt[3]{4y}} \times \frac{\left(\sqrt[3]{4y}\right)^2}{\left(\sqrt[3]{4y}\right)^2} = \frac{\sqrt[3]{x}\,(4y)^{2/3}}{\left(\sqrt[3]{4y}\right)^3} = \frac{\sqrt[3]{x}\left[(4y)^2\right]^{\frac{1}{3}}}{(4y)^{\frac{1}{3}\times 3}} = \frac{\sqrt[3]{x}\,\sqrt[3]{16y^2}}{4y} = \frac{\sqrt[3]{16xy^2}}{4y}$$

Chapter 8 Questions

Ch8 Test #1

Solve $25x^2 - 7 = 0$

Ch8 Test #3

Solve $x^2 + 2x + 3 = 0$

Ch8 Test #4

Solve $2x + 5 = x^2$

Ch8 Test #6

Solve $x^2 + 3x = 5$

Ch8 Test #7

Let $f(x) = 12x^2 - 19x - 21$. Find x such that $f(x) = 0$

Rationalize the denominator.

$$\frac{\sqrt[3]{x}}{\sqrt[3]{2y^2}} \times \frac{\left(\sqrt[3]{2y^2}\right)^2}{\left(\sqrt[3]{2y^2}\right)^2} = \frac{\sqrt[3]{x} \times (2y^2)^{2/3}}{\left(\sqrt[3]{2y^2}\right)^3} = \frac{\sqrt[3]{x}\left[(2y^2)^2\right]^{\frac{1}{3}}}{(2y^2)^{\frac{1}{3}\times 3}} = \frac{\sqrt[3]{x}\,\sqrt[3]{4y^4}}{2y^2} = \frac{\sqrt[3]{4xy^4}}{2y^2}$$

Ch8 Test #10

Solve $x^2 + 10x + 15 = 0$

Rationalize the denominator of $\frac{\sqrt[3]{x}}{\sqrt[3]{y}} \times \frac{\left(\sqrt[3]{y}\right)^2}{\left(\sqrt[3]{y}\right)^2}$

$$= \frac{\sqrt[3]{x} \times \left(\sqrt[3]{y}\right)^2}{\left(\sqrt[3]{y}\right)^{1+2}} = \frac{\sqrt[3]{x}\,\sqrt[3]{y^2}}{\left(\sqrt[3]{y}\right)^3} = \frac{\sqrt[3]{xy^2}}{y}$$

* $\left(\sqrt[3]{a}\right)^3 = a = \sqrt[3]{a^3}$