Honors Practice Final (2023) Name (worked out answers) ID: 1

source: Chapter 8 Test 2024 Date Period

INSTRUCTIONS: (Each question is 6 points with 2 pts/factor)

Simplify each expression.
Clearly show work (however, you are not required to show how you +, -, /, or * exponents)
Use only POSITIVE exponents.
No decimals. in answers
Write answers with variables in ABC order.

CIRCLE YOUR FINAL ANSWER.

* 1) $4zy^3 \cdot 2zx^0y^4$

$8x^{0}y^7z^2 = \boxed{8y^7z^2}$

* 2) $-yx^2 \cdot -6xy \cdot -5x^4y^3$

$\boxed{-30x^7y^5}$

* MULTIPLY NUMBERS
* ADD EXPONENTS

* 3) $4x^5y^7z^{-4} \cdot 5x^{-5}z^4$

$20x^{0}y^7z^{0} = \boxed{20y^7}$

4) $\dfrac{-5x^3y^5z^5}{-x^3y^4z^4}$

$5x^{0}yz = \boxed{5yz}$

* divide numbers
* subtract exponents

5) $(-2x^2y^2z^0)^3 \cdot -2x^4y^0z^4$

$(-2)^3x^6y^6z^0 \cdot -2x^4y^0z^4$

$(-8)(-2)x^{10}y^6z^4$

$\boxed{16x^{10}y^6z^4}$

power to power → MULT exponents

6) $-2y^2z^3 \cdot (2x^2y^4z^3)^0$

$\boxed{-2y^2z^3}$

$x^0 = 1$ anything to zero is 1

7) $(-x^3y^2)^2 \cdot (2y^3)^4$

$(-1)^2x^6y^4 \cdot 2^4y^{12} =$

$\boxed{16x^6y^{16}}$

8) $3x^4z^3 \cdot 3y^{-2}z^{-3}$

$9x^4y^{-2}z^{0}$

$z^0 = 1$

ALL exponents must be positive

$\boxed{\dfrac{9x^4}{y^2}}$

9) $x^4y^4 \cdot (2y^{-4})^4$

$x^4y^4 \cdot 2^4 x^{-16}$

$16x^{-12}y^4$

$$\frac{16y^4}{x^{12}}$$

10) $(2x)^{-2} \cdot xy^4$

$(2)^{-2}x^{-2} \cdot xy^4$

$$\frac{xy^4}{(2)^2x^2} = \frac{x^{-1}y^4}{4}$$

$$\frac{y^4}{4x}$$

11) $2y^3 \cdot (2x^3y^{-6})^3$

$2y^3 \cdot 2^3x^9y^{-18}$

$2 \cdot 8\, x^9y^{-15}$

$$\frac{16x^9}{y^{15}}$$

12) $2x^6 \cdot (-2x^2y^2)^5$

$2x^6 \cdot (-2)^5x^{10}y^{10}$

$2 \cdot -32\, x^{16}y^{10}$

$-64x^{16}y^{10}$

13) $\dfrac{3x^3y^2 \cdot 3x^3y^{-3}}{4y^2}$

simplify num

$\dfrac{9x^6y^{-1}}{4y^2}$ simplify den

$\dfrac{9x^6y^{-3}}{4}$

$$\frac{9x^6}{4y^3}$$

14) $\left(\dfrac{xy^{-4} \cdot 2x^{-2}y^0}{x^4}\right)^2$ MULT EVERY EXPONENT times 2

simplify num

$\dfrac{x^2y^{-8}(2)^2x^{-4}y^0}{x^8}$ den

$\dfrac{4x^{-2}y^{-8}}{x^8}$

$4x^{-10}y^{-8} = \dfrac{4}{x^{10}y^8}$

source: Chapter 9 Factoring Test (ALL PROBLEMS ARE 6 POINTS)

STEP 1 – ALWAYS FACTOR GCF

Factor each completely.

15) $-21n^2 + 30n + 24$

NEG A FACTOR OUT -1

$-3(7n^2 - 10n - 8)$

$-3(7n + 4)(n - 2)$

$4n \quad -14n$

16) $6x^3 - 28x^2 + 16x$

$2x(3x^2 - 14x + 8)$

SIGNS 18 24

$2x(3x - 2)(x - 4)$

$-2x \quad -14x$

17) $-6n^3 + 36n^2 + 240n$

$-6n(n^2 - 6n - 40)$

$-6n(n+4)(n-10)$

18) $5x^4 - 5x^3 - 280x^2$

$5x^2(x^2 - x - 56)$

$5x^2(x+7)(x-8)$

19) $32x^5 - 40x^4 + 32x^3 - 40x^2$

$8x^2(4x^3 - 5x^2 + 4x - 5)$

$8x^3[x^2(4x-5) + 1(4x-5)]$

$8x^3(4x-5)(x^2+1)$

since + cannot factor more

20) $21a^3 - 28a^2 - 84a + 112$

FACTOR BY GROUPING

$7(3a^3 - 4a^2 - 12a + 16)$

$7[a^2(3a-4) - 4(3x-4)]$

$7(3a-4)(a^2-4)$

$7(3a-4)(a-2)(a+2)$

21) $16x^2 - 80x + 100$

PSQ PSQ

$4(4x^2 - 20x + 25)$

$4(2x - 5)(2x - 5)$

OR

$4(2x-5)^2$

22) $18n^4 - 8n^2$

$2n^2(9n^2 - 4)$

$2n^2(3n-2)(3n+2)$

Solve each equation by factoring. Leave solution(s) as fractions.
Remeber to use your calculator to check in the original equation!

23) $13x^2 - 35x + 52 = -8 + 8x^2$

$5x^2 - 35x + 60 = 0$

$5(x^2 - 7x + 12) = 0$

$5(x-3)(x-4) = 0$

$x - 3 = 0$ → $x = 3$

$x - 4 = 0$ → $x = 4$

C: $64 = 64$ ✓ C: $120 = 120$

24) $4n^2 + 28n - 62 = -6 + 8n$

$4N^2 + 20N - 56 = 0$

$4(N^2 + 5N - 14) = 0$

$4(N+7)(N-2) = 0$

$N + 7 = 0$ → $N = -7$

$N - 2 = 0$ → $N = 2$

C: $-62 = -62$ ✓ C: $10 = 10$ ✓

25) $-140x^3 + 160x^2 = -35x + 40$

$0 = 140x^3 - 160x^2 - 35x + 40$

$0 = 5(28x^3 - 32x^2 - 7x + 8)$

$0 = 5[4x^2(7x-8) - 1(7x-8)]$

$0 = 5(7x-8)(4x^2-1)$

$0 = 5(7x-8)(2x-1)(2x+1)$

$5 = 0$

$7x - 8 = 0$ → $x = 8/7$

$2x - 1 = 0$ → $x = 1/2$

$2x + 1 = 0$ → $x = -1/2$

Remember to do CALC checks IN ORIG EQ

26) $8x^8 + 4x^7 = 8x^6 + 4x^5$

$8x^8 + 4x^7 - 8x^6 - 4x^5 = 0$

$4x^5(2x^3 + x^2 - 2x - 1) = 0$

$4x^5[x^2(2x+1) - 1(2x+1)] = 0$

$4x^5(2x+1)(x^2-1) = 0$

$4x^5(2x+1)(x-1)(x+1) = 0$

$4x^5 = 0$ → $x = 0$

$2x + 1 = 0$ → $x = -1/2$

$x - 1 = 0$ → $x = 1$

$x + 1 = 0$ → $x = -1$

(page 2) Solve each equation by factoring. Leave solution(s) as fractions.
Remeber to use your calculator to check in the original equation!

27) $5x^2 = 10x$

$5x^2 - 10x = 0$

$5x(x-2) = 0$

$5x = 0$ $\quad$ $x - 2 = 0$

$x = 0$ $\quad$ $x = 2$

C: $0 = 0$ ✓ $\quad$ C: $20 = 20$ ✓

STEP 1: Set EQ = 0

STEP 2: FACTOR GCF Then Keep factoring if possible

STEP 3: set every factor = 0 → SOLVE

28) $-5x^3 = 120x - 55x^2$

$0 = 5x^3 - 55x^2 + 120x$

$0 = 5x(x^2 - 11x + 24)$

$0 = 5x(x-3)(x-8)$

$5x = 0$ $\quad$ $x - 3 = 0$ $\quad$ $x - 8 = 0$

$x = 0$ $\quad$ $x = 3$ $\quad$ $x = 8$

C: $0 = 0$ ✓ $\quad$ C: $-135 = -135$ ✓ $\quad$ C: $-2560 = -2560$ ✓

29) $36x^3 = 16x$

$36x^3 - 16x = 0$ — SPECIAL CASE PSQ - PSQ

$4x(9x^2 - 4) = 0$

$4x(3x-2)(3x+2) = 0$

$4x = 0$ $\quad$ $3x - 2 = 0$ $\quad$ $3x + 2 = 0$

$x = 0$ $\quad$ $x = 2/3$ $\quad$ $x = -2/3$

C: $0 = 0$ ✓

30) $8x^2 = 24x - 18$

Special case 1st + last terms are perfect squares

$8x^2 - 24x + 18 = 0$

$2(4x^2 - 12x + 9) = 0$

$2(2x-3)(2x-3) = 0$

$2 = 0$ $\quad$ $2x - 3 = 0$ repeated factor

$x = 3/2$ or 1.5

C: $18 = 18$ ✓

Answers to source: Chapter 8 Test (ID: 1)

1) $8z^2y^7$

2) $-30y^5x^7$

3) $20y^7$

4) $5yz$

5) $16x^{10}y^8$

6) $-2y^2z^3$

7) $16x^6y^{16}$

8) $\frac{9x^4}{y^2}$

9) $\frac{16x^4}{y^{12}}$

10) $\frac{y^4}{4x}$

11) $\frac{16x^9}{y^{15}}$

12) $-64x^{16}y^{10}$

13) $\frac{9x^6}{4y^3}$

14) $\frac{4}{y^8x^{10}}$

15) $-3(7n + 4)(n - 2)$

16) $2x(3x - 2)(x - 4)$

17) $-6n(n - 10)(n + 4)$

18) $5x^2(x - 8)(x + 7)$

19) $8x^2(x^2 + 1)(4x - 5)$

20) $7(a - 2)(a + 2)(3a - 4)$

21) $4(2x - 5)(2x - 5)$

22) $2n^2(3n + 2)(3n - 2)$

23) $5(x - 3)(x - 4) = 0$

x={3, 4}

24) $4(n + 7)(n - 2) = 0$

n={−7, 2}

25) $-5(7x - 8)(2x + 1)(2x - 1) = 0$

x=8/7, -1/2, 1/2

26) $4x^5(2x + 1)(x + 1)(x - 1)=0$

x=0, -1/2, -1, 1

27) $5x(x - 2) = 0$

x={0, 2}

28) $-5(7x - 8)(2x + 1)(2x - 1) = 0$

x={0, 3, 8}

29) $4x(3x + 2)(3x - 2) = 0$

x=0, 2/3, -2/3

30) $2(2x - 3)^2 = 0$

x=3/2 or 1.5

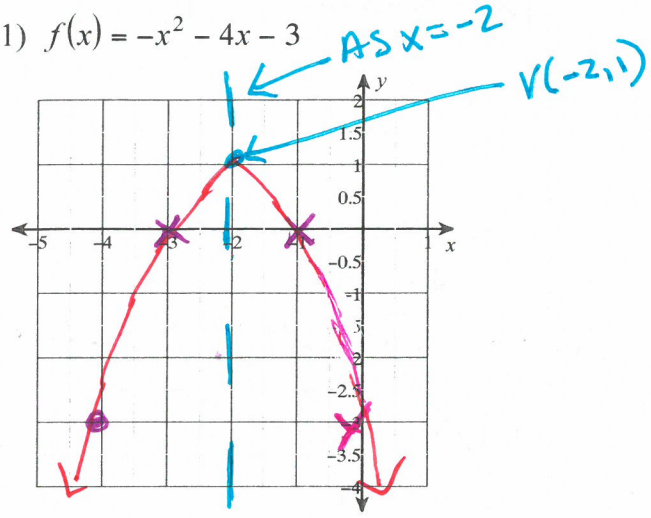
SOURCE: Chapter 10 Test (complete sq & WP)

Date_____ Period____

DIRECTIONS- CLEARLY SHOW WORK TO RECEIVE ANY CREDIT!!!!

Solve and check by Graphing. (12 pts each)
1) Clearly graph each function and label the graph with key features: Y-INTERCEPT(Y), vertex(V), axis of symmetry (AS), and solutions (X).
2) Clearly show calculations for the vertex and axis of symmetry.
3) Clearly plot 5 points and provide the table for these points.
4) Identify solutions by writing "SOLUTIONS are x=..."

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



A=-1 B=-4 C=-3 ↑ yINT

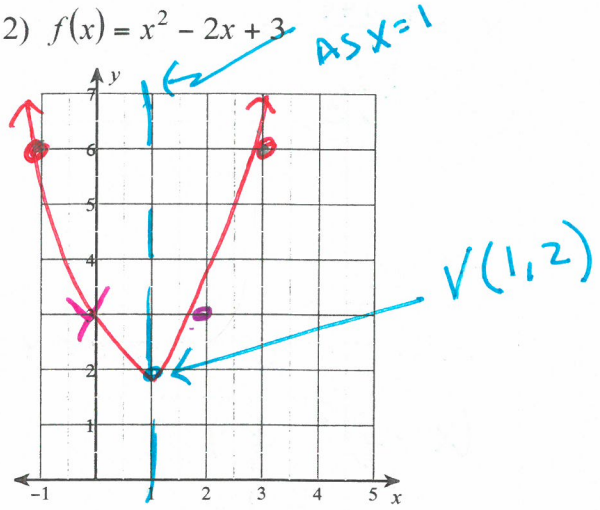
AS: $x = \frac{-B}{2A} = \frac{4}{2(-1)}$

X=-2

X	-4	-3	-2	-1	0
Y	-3	0	1	0	-3

Solutions
X = -1, -3

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



A=1 B=-2 C=3 ↑ yINT

AS: $x = \frac{2}{2(1)}$

X=1

X	-1	0	1	2	3
Y	6	3	2	3	6

Solutions
X = No solution
NO XINT's

Solve each equation by taking square roots. (6 pts each) ISOLATE ✓

3) $9x^2 + 500 = 549$

$-500 \quad -500$

$\frac{9x^2}{9} = \frac{49}{9}$

$\sqrt{x^2} = \sqrt{\frac{49}{9}}$ ← NOW TAKE √

$x = \pm \frac{\sqrt{49}}{\sqrt{9}}$

$x = \pm 7/3$

4) $-8 + 8x^2 = -88$

$+8 \quad +8$

$\frac{8x^2}{8} = \frac{-80}{8}$

$\sqrt{x^2} = \sqrt{-10}$ → Cannot take √ of a neg number

$x =$ NO SOLUTION

Solve each equation by completing the square. (6 pts each)

5) $x^2 - 6x - 5 = -10$

$+5 \quad +5$

$x^2 - 6x + 9 = -5 + 9$

$\sqrt{(x-3)^2} = \sqrt{4}$

$x - 3 = \pm 2$

$x = 3 \pm 2$

$x = 3 + 2$

$x = 5$

$x = 3 - 2$

$x = 1$ ✓

6) $x^2 + 16x + 54 = -9$

$-54 \quad -54$

$x^2 + 16x + 64 = -63 + 64$

$\sqrt{(x+8)^2} = \sqrt{1}$

$x + 8 = \pm 1$

$x = -8 \pm 1$

$x = -8 + 1$

$x = -7$

$x = -8 - 1$

$x = -9$

Solve each equation with the Quadratic formula. Check. (6 pts each)

7) $-x^2 = -14 - 5x$

$0 = x^2 - 5x - 14$ ← #1 - PUT IN $Ax^2 + Bx + C = 0$

$A = 1 \quad B = -5 \quad C = -14$

← #2 QUAD FORMULA

$x = \frac{5 \pm \sqrt{25 - 4(1)(-14)}}{2(1)}$

$x = \frac{5 \pm \sqrt{81}}{2}$

$x = \frac{5+9}{2}$

$x = 7$

C: $-49 = -49$ ✓

$x = \frac{5-9}{2}$

$x = -2$

C: $-4 = -4$ ✓

8) $-4x^2 + 5x - 21 = x - 5x^2$

$+5x^2 - x \quad -x + 5x^2$

$x^2 + 4x - 21 = 0$

$A = 1 \quad B = 4 \quad C = -21$

$x = \frac{-4 \pm \sqrt{16 - 4(1)(-21)}}{2(1)}$

$x = \frac{-4 \pm \sqrt{100}}{2}$

$x = \frac{-4+10}{2}$

$x = 3$

C: $-42 = -42$ ✓

$x = \frac{-4-10}{2}$

$x = -7$

$-252 = -252$ ✓

Solve and check equation with the quadratic formula. Round 2 decimals. CHECK REQUIRED! (8pts)

9) $-2x^2 - 9x + 3 = 0$ $A=-2$ $B=-9$ $C=3$

$$X = \frac{9 \pm \sqrt{81 - 4(-2)(3)}}{2(-2)}$$

$$X = \frac{9 \pm \sqrt{105}}{-4}$$

$X = \frac{9+\sqrt{105}}{-4}$ $X \approx -4.81$ C: $0.0178 \simeq 0$ ✓

$X = \frac{+9-\sqrt{105}}{-4}$ $X \simeq 0.31$ C: $0.0178 \simeq 0$ ✓

Solve each quadratic equation using any algebraic method (taking square roots, completing the square, quadratic formula, or factoring). (4 pts each) ANSWERS VARY

10) $4n^2 - 7 = -3$ ← SQROOT

$+7 \quad +7$

$\frac{4N^2}{4} = \frac{4}{4}$

$\sqrt{N^2} = \sqrt{1}$

$N = \pm 1$

11) $-2x^2 - 4x - 2 = 0$ ← Q FORMULA

$A=-2$ $B=-4$ $C=-2$

$$X = \frac{4 \pm \sqrt{16 - 4(-2)(-2)}}{2(-2)}$$

$X = \frac{4 \pm \sqrt{0}}{-4}$

$X = -1$

12) $x^2 - 80 = -2x$

$+2x \quad +2x$

$X^2 + 2X - 80 = 0$ ← FACTOR 8, 10

$(X+10)(X-8) = 0$

$X+10=0$ $X=-10$ C: $20=20$ ✓

$X-8=0$ $X=8$ C: $-16=-16$ ✓

13) $4x^2 - 2x = 6$

$-6 \quad -6$

$4X^2 - 2X - 6 = 0$ ← Q FORMULA

$A=4$ $B=-2$ $C=-6$

$$X = \frac{2 \pm \sqrt{4 - 4(4)(-6)}}{2(4)}$$

$X = \frac{2 \pm \sqrt{100}}{8}$

$X = \frac{2+10}{8}$ $X = 1.5$ C: $6=6$ ✓

$X = \frac{2-10}{8}$ $X = -1$ C: $6=6$ ✓

Find the discriminant of each quadratic equation then state the number of solutions. (6pts each)

14) $-9x^2 + 6x - 7 = -7$

$+7 \quad +7$

$-9x^2 + 6x = 0$

$A=-9 \quad B=6 \quad C=0$

$D = 36 - 4(-9)(0)$

$D = 36$

2 Solutions

#1 Put into $Ax^2+Bx+C=0$

#2 Find $D = B^2 - 4AC$

#3 $+D \rightarrow$ 2 sol
$-D \rightarrow$ No sol
$D=0 \rightarrow$ 1 sol

$D = B^2 - 4AC$

15) $8x^2 + 8x - 6 = -8$

$+8 \quad +8$

$8x^2 + 8x + 2 = 0$

$A=8 \quad B=8 \quad C=2$

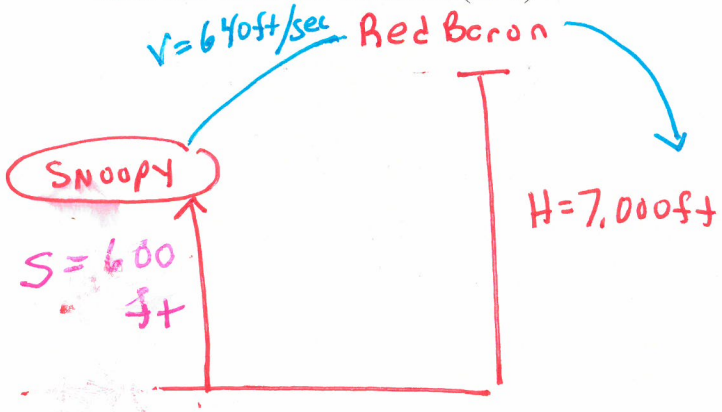
$D = 64 - 4(8)(2)$

$D = 0$

1 SOLUTION

Snoopy is flying 600 feet above the ground and spots his archrival the Red Baron flying at a height of 7,000 feet above the ground. Snoopy has 1 chance to shoot the Red Barron down. His machine gun takes a shot at 640ft/second.

16) (a) Sketch and label the graph. Include units and label the variables.(6PT)



(b) Write the vertical model equation substituting all values (2PT)

$H = -16T^2 + VT + S$ — Memorize Vertical Model EQ

$7000 = -16T^2 + 640T + 600$

17) Does Snoopy hit the Red Baron? If so, how long will it take bullet to shoot down the Red Baron? Clearly show your work. (4PTs)

Answer in a sentence (2PTs)

$0 = -16T^2 + 640T - 6400$

$A=-16 \quad B=640 \quad C=-6400$

$t = \frac{-640 \pm \sqrt{409600 - 4(-16)(-6400)}}{2(-16)}$

$t = \frac{-640 \pm \sqrt{0}}{-32}$

$t = 20$

SNOOPY HITS THE RED BARON AT 20 seconds

18) A hawk, flying at a height of 64 feet, spots a rat on the ground. If he dives down to catch the rat at a speed of 48 feet per second, how long will it take him to catch the rat?

(a) Sketch and label the graph. Include units and label the variables.(6PT)

(b) Write the vertical motion equation (2PT) $H = -16T^2 + VT + S$

$0 = -16T^2 + 48T + 64$

(c) Find the time. Clearly show your work. (2PTs)

$0 = -16T^2 + 48T + 64$

FACTOR OR USE QFORMULA → FACTOR

$0 = -16(T^2 - 3T - 4)$

$0 = -16(T-4)(T+1)$

$-16 = 0$ $\quad T-4=0$, $t=4$ $\quad T+1=0$, $t=-1$

Conclusion!

The hawk catches the rat on the ground at 4 seconds

source: CHAPTER 11 TEST (MAKEUP)

INSTRUCTIONS: Clearly show work for full credit !!!!!!!!!!!! Circle final answers!!

Simplify. NO radicals in the denominator. Simplify fractions. (4 points each)

19) $3\sqrt{96}$ $= \sqrt{4}$

$3\sqrt{16}\sqrt{6} =$

$12\sqrt{6}$

20) $\sqrt{400x^2y^6} = 20xy^2$

↑ perfect SQUARE

21) $\sqrt{18x^3y}$

$\sqrt{9x^2}\sqrt{2xy}$

$3x\sqrt{2xy}$

22) $\sqrt{\frac{144}{81}} = \frac{\sqrt{144}}{\sqrt{81}} = \frac{12}{9} = \frac{3}{2}$

23) $\frac{\sqrt{9}}{\sqrt{6}} \cdot \frac{\sqrt{6}}{\sqrt{6}} = \frac{\sqrt{54}}{6}$

$\frac{\sqrt{9}\sqrt{6}}{6} = \frac{3\sqrt{6}}{6} = \frac{\sqrt{6}}{2}$

24) $\frac{\sqrt{4}}{\sqrt{20}} = \frac{2}{\sqrt{4}\sqrt{5}} = \frac{2}{2\sqrt{5}} = \frac{1}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{\sqrt{5}}{5}$

NO RADICAL IN Denominator

25) $3\sqrt{3} + 5\sqrt{6} - 3\sqrt{3}$

$5\sqrt{6}$

Combine Like Radicals

26) $3\sqrt{6} + 4\sqrt{3} + 3\sqrt{6} - \sqrt{3}$

$6\sqrt{6} + 3\sqrt{3}$

27) $\sqrt{6}(\sqrt{6} + \sqrt{2})$

$\sqrt{36} + \sqrt{12}$

$6 + \sqrt{4}\sqrt{3}$

$6 + 2\sqrt{3}$

28) $2\sqrt{2}(2\sqrt{2} + \sqrt{10})$

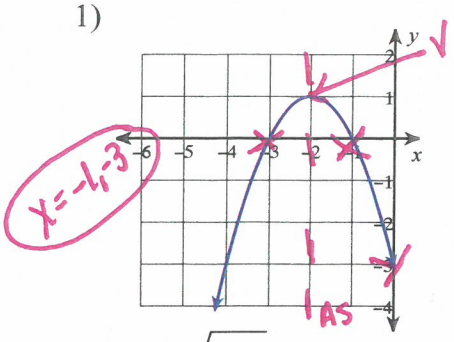
$4\sqrt{4} + 2\sqrt{20}$

$4 \cdot 2 + 2\sqrt{4}\sqrt{5}$

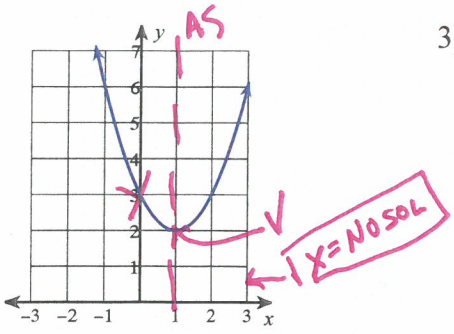
$8 + 4\sqrt{5}$

Answers to SOURCE: Chapter 10 Test (complete sq & WP) (ID: 1)

1)



2)



3) $\{x=\frac{7}{3}, -\frac{7}{3}\}$

4) $\{x = \sqrt{-10}\}$
THEREFORE X=NO SOLUTION

5) $\{5, 1\}$

6) $\{-7, -9\}$

7) $\{-2, 7\}$

8) $\{3, -7\}$

9) $\{0.312, -4.812\}$

10) $\{1, -1\}$

11) $\{-1\}$

12) $\{8, -10\}$

13) $\{\frac{3}{2}, -1\}$

14) D=36; two real solutions

15) D=0; one real solution

16) 7000 = -16tt + 640t + 600

17) 7000 = -16tt + 640t + 600
0 = -16tt + 640t - 6400
0 = -16(tt - 40t + 400)
0= -16 (t-20) (t-20)
t-20=0
t=20
Snoopy hits the Red Barron with his shot at 20 seconds.

18) 0= -16 (t+1) (t-4)
t+1=0 t-4=0
t=-1,4
The hawk will catch the rat in 4 seconds.

19) $12\sqrt{6}$

20) $20xy^3$

21) $3x\sqrt{2xy}$

22) $\frac{12}{9} = \frac{3}{2}$

23) $\frac{\sqrt{6}}{2}$

24) $\frac{\sqrt{5}}{5}$

25) $5\sqrt{6}$

26) $6\sqrt{6} + 3\sqrt{3}$

27) $6 + 2\sqrt{3}$

28) $8 + 4\sqrt{5}$

29) $-24 - 4\sqrt{5}$

30) $8 + 6\sqrt{3}$

31) $-22\sqrt{2}$

32) $\{-9\}$

33) $\{-1\}$

34) $\{-2\}$

35) $\{8, 4\}$

36) x=7; -3 is an extraneous solution

37) x=1; -2 is an extraneous solution

38) $0 = x^2 - 6x + 8$
x=No solution;
x=2,4 are extraneous solution

Simplify. (6 points each)

29) $(1 - 5\sqrt{5})(1 + \sqrt{5})$

30) $(\sqrt{3} + 1)(\sqrt{3} + 5)$

31) $-3\sqrt{18} - 2\sqrt{8} - 3\sqrt{18}$

---------- > **Chapter 11 - these problems will not be on the FINAL!!!!!!!!!**

Solve each equation. Remember to check for extraneous solutions. (6 points each)

32) $\sqrt{-5 - x} = 2$

33) $10 = 9 + \sqrt{-1 - 2p}$

34) $\sqrt{1 - 6x} = \sqrt{3 - 5x}$

35) $\sqrt{-32 + 12x} = x$

36) $\sqrt{21 + 4x} = x$

37) $x = \sqrt{2 - x}$

38) $x - 6 = \sqrt{-6x + 28}$