

Alg 2 HW - 3-5 → 3-12

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

2) $4x^2 - 12x + 9 + 5$
 $4x^2 - 12x + 14$

3) $2(x^2 - 6x + 7)$
 $2(x+7)(x-1)$

b) $\left(\frac{3x^2y}{x^3}\right)^4$ 1) $\frac{81x^8y^4}{x^{12}}$

2) $\frac{81y^4}{x^4}$

3) $\left(\frac{3x^2y}{x^3}\right)^2 \left(\frac{3x^2y}{x^3}\right)^2$

3-6) a) $\sqrt{4x^2y^4} = 2xy^2$ (3)

b) $\sqrt{8x^2y} = 2x\sqrt{2y}$ (4)

c) $\sqrt{4x^2y} = 2x\sqrt{y}$ (1)

d) $\sqrt{16xy^2} = 4y\sqrt{x}$ (5)

e) $\sqrt{8xy^2} = 2y\sqrt{2x}$ (2)

3-7) They are both correct: $\frac{x^{12}y^3}{64}$

Sometimes it is easier to simplify inside the parentheses first

3-8) a) $y=3$ horizontal line through $(0, 3)$
 D: all real #'s
 R: $y=3$

b) $x=-2$ vertical line through $(-2, 0)$
 D: $x=-2$
 R: all real #'s

c) They intersect @ $(-2, 3)$

Mon 12/1 3.0.2 (3-23 → 3-29)

3-23) a) $(x+3)^2$ x^2+9
 $(x+3)(x+3)$
 $x^2+6x+9 \neq x^2+9$ Not equivalent

b) $(x+4)^2$ $x^2+8x+16$
 $(x+4)(x+4)$
 $x^2+8x+16 = x^2+8x+16$ Equivalent

c) $(x+1)(2x-3)$ $2x^2-x-3$
 $2x^2-3x+2x-3$
 $2x^2-x-3 = 2x^2-x-3$ Equivalent

d) $3(x-4)^2+2$ $3x^2-24x+50$
 $3(x-4)(x-4)+2$
 $3(x^2-8x+16)+2$
 $3x^2-24x+48+2$
 $3x^2-24x+50 = 3x^2-24x+50$ Equivalent

e) $(x^3)^4$ x^7
 $x^{12} \neq x^7$ Not equivalent

f) $ab^2 \neq a^2b^2$ Not equivalent

3-24) a) If $x=0$

e) If $x=0$ or $x=1$

f) If $a=1$ or $b=0$

3-25) a) $2000x-4000=8000$ Divide by 2000
 $x-2=4$

b) $x-2=4$
 $+2=+2$
 $x=6$ ✓
 $\frac{2000x}{2000} = \frac{12000}{2000}$
 $x=6$ ✓

multiply by 50 c) $\frac{3}{50} - \frac{x}{50} = \frac{7}{50}$

$3 - x = 7$
 $-x = 4$

$x = -4$

3-26) a) goes down by 3 each term

$$t(n) = -3n + 17 \quad (\text{Line w/ } -\frac{3}{1} \text{ slope and } (0, 17) \text{ y-int.})$$

b) multiply each term by .8

$$\frac{32}{40} = 0.8$$

$$t(n) = 40(0.8)^{n-1} \quad \text{or}$$

$$t(n) = 50(0.8)^n$$

decreasing exponential curve with y-int (0, 50)

3-27) a) $h(0) = -3(0)^2 - 11(0) + 4 = \boxed{4}$

b) $h(2) = -3(2)^2 - 11(2) + 4 = -12 - 22 + 4 = \boxed{-30}$

c) $h(-1) = -3(-1)^2 - 11(-1) + 4 = -3 + 11 + 4 = \boxed{12}$

d) $h(\frac{1}{2}) = -3(\frac{1}{2})^2 - 11(\frac{1}{2}) + 4$
$$= \frac{-3}{4} - \frac{11}{2} + 4 = \frac{-3}{4} - \frac{22}{4} + \frac{16}{4} = \boxed{\frac{9}{4}}$$

e) $0 = -3x^2 - 12x + 4$ A.C. = $\begin{matrix} -12 \\ / \quad \backslash \\ -12x \quad 4x \end{matrix}$

$$\begin{aligned} & -3x^2 - 12x + 4x + 4 \\ & -3x(x+4) + 1(x+4) \\ & (x+4)(-3x+1) \end{aligned}$$

$$\begin{aligned} x+4 &= 0 \\ x &= -4 \end{aligned}$$

$$\begin{aligned} -3x+1 &= 0 \\ -3x &= -1 \\ x &= \frac{1}{3} \end{aligned}$$

$$\boxed{x = 4, \frac{1}{3}}$$

3-28)

$$y - x^2 = 6x$$

$$+x^2 \quad +x^2$$

$$\begin{aligned} y &= x^2 + 6x \\ 0 &= x^2 + 6x \\ &= x(x+6) \end{aligned}$$

$$x=0$$

$$x=-6$$

$$\begin{aligned} (0, 0) \\ (-6, 0) \end{aligned}$$

$$2-113) a) \frac{y}{2} = \frac{2(x-17)^2}{2}$$

$$\sqrt{\frac{y}{2}} = \sqrt{(x-17)^2}$$

$$\pm \sqrt{\frac{y}{2}} = \begin{matrix} x-17 \\ +17 \end{matrix}$$

$$\boxed{x = \pm \sqrt{\frac{y}{2}} + 17}$$

$$b) (y+7)^3 = (\sqrt[3]{x+5})^3$$

$$\begin{matrix} (y+7)^3 = x+5 \\ -5 \qquad -5 \end{matrix}$$

$$\boxed{x = (y+7)^3 - 5}$$

$$2-114) a) \begin{cases} y = 5x - 2 \\ y = 3x + 18 \end{cases}$$

$$\begin{matrix} 3x + 18 = 5x - 2 \\ -3x \quad -3x \end{matrix}$$

$$\begin{matrix} 18 = 2x - 2 \\ -2 \qquad +2 \end{matrix}$$

$$\frac{20}{2} = \frac{2x}{2}$$

$$x = 10$$

$$\begin{matrix} y = (5)(10) - 2 \\ y = 50 - 2 = 48 \end{matrix}$$

$$\boxed{(10, 48)}$$

$$b) \begin{cases} y = x - 4 \\ 2x + 3y = 17 \end{cases}$$

$$2x + 3(x-4) = 17$$

$$2x + 3x - 12 = 17$$

$$\begin{matrix} 5x - 12 = 17 \\ +12 \quad +12 \end{matrix}$$

$$\frac{5x}{5} = \frac{29}{5}$$

$$x = 29/5$$

$$y = \frac{29}{5} - 4$$

$$y = \frac{29}{5} - \frac{20}{5} = \frac{9}{5}$$

$$\boxed{\left(\frac{29}{5}, \frac{9}{5}\right)}$$

$$2-115) a) \sqrt[3]{15} + \sqrt[3]{27} = \sqrt[3]{3 \cdot 25} + \sqrt[3]{3 \cdot 9} = 5\sqrt[3]{3} + 3\sqrt[3]{3}$$

$$\boxed{= 8\sqrt[3]{3}}$$

$$b) \sqrt{x} + 2\sqrt{x} = \boxed{3\sqrt{x}}$$

$$c) (\sqrt{12})^2 = 12$$

$$d) (3\sqrt{12})^2 = 9(12) = 108$$

2-116) $g(x) = x^2 - 5$

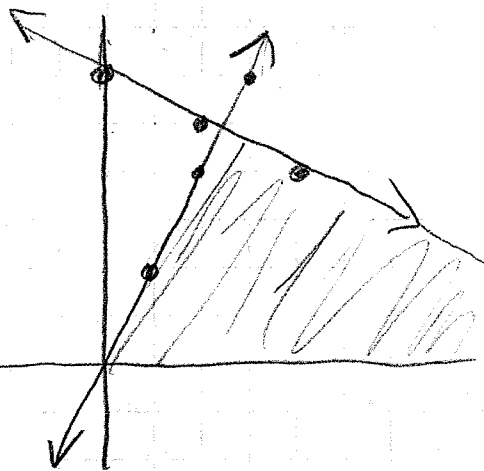
a) $g(\frac{1}{2}) = (\frac{1}{2})^2 - 5 = \frac{1}{4} - 5 = \frac{1}{4} - \frac{20}{4} = \frac{-19}{4} = -4.75$

b) $g(n+1) = (n+1)^2 - 5 = n^2 + 2n + 1 - 5 = n^2 + 2n - 4$

2-117) $y = 2x \Rightarrow m = 2, b = 0$
 $y = -\frac{1}{2}x + 6 \Rightarrow m = -\frac{1}{2}, b = 6$

a) $y = 2x$
 x int: $(0, 0)$
 y int: $(0, 0)$

$y = -\frac{1}{2}x + 6$
 x int: $0 = -\frac{1}{2}x + 6$
 $-6 = -\frac{1}{2}x$
 $12 = x$
 $(12, 0)$
 y int: $(0, 6)$



$2x = -\frac{1}{2}x + 6$
 $+\frac{1}{2}x + \frac{1}{2}x$

$\frac{4x + 1x}{2} = 6$

$(\frac{2}{5}) \frac{5}{2} x = 6 (\frac{2}{5})$

$x = \frac{12}{5}$
 $x = 2.4$

$y = 2(2.4)$
 $y = 4.8$

b) It is a triangle with vertices $(0,0)$, $(12,0)$ and $(2.4, 4.8)$

c) D: $0 \leq x \leq 12$
 R: $0 \leq y \leq 4.8$

d) $A = \frac{bh}{2} = \frac{12(4.8)}{2} = 28.8$
 2 sq units

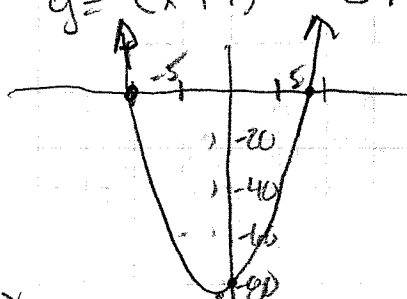
intersect @ $(2.4, 4.8)$

2-118) $y \approx 2(x-5)^2 + 2$ and $y \approx -\frac{1}{2}(x-5)^2 + 2$

2-119) $y = x^2 + 2x - 80$

$y = (x^2 + 2x + 1) - 80 - 1$

$y = (x+1)^2 - 81$



or: $(-1, -81)$

x int: $0 = x^2 + 2x - 80$
 $(x+10)(x-8)$
 $x = -10 \quad x = 8$

$(-10, 0)$
 $(8, 0)$

y int: $y = (0)^2 + 2(0) - 80$
 $(0, -80)$

2-120) $-578 = \frac{-5n}{-7} + 7$

$\frac{-585}{-5} = \frac{-5n}{-5}$

$n = 117$

yes when $n = 117$ ✓

Solve each quadratic equation by completing the square. Find the solution in the key below to uncover riddle answer. ANSWER KEY

1. $x^2 - 6x + 2 = 0$ $\{3 \pm \sqrt{7}\}$ C

2. $x^2 - 12x - 10 = 0$ $\{6 \pm \sqrt{46}\}$ S

3. $x^2 + 6x - 4 = 0$ $\{-3 \pm \sqrt{13}\}$ H

4. $x^2 + 6x + 2 = 0$ $\{-3 \pm \sqrt{7}\}$ O

5. $x^2 + 4x - 13 = 0$ $\{-2 \pm \sqrt{17}\}$ F

6. $x^2 - 14x - 44 = 0$ $\{7 \pm \sqrt{93}\}$ R

7. $x^2 + 10x - 21 = 0$ $\{-5 \pm \sqrt{46}\}$ B

8. $x^2 + 2x - 5 = 0$ $\{-1 \pm \sqrt{6}\}$ L

9. $x^2 + 2x = 1$ $\{-1 \pm \sqrt{2}\}$ U

10. $x^2 - 2x - 2 = 0$ $\{1 \pm \sqrt{3}\}$ E

11. $x^2 - 4x - 3 = 0$ $\{2 \pm \sqrt{7}\}$ P

12. $x^2 + 4x - 6 = 0$ $\{-2 \pm \sqrt{10}\}$ I

13. $x^2 + 8x + 2 = 0$ $\{-4 \pm \sqrt{14}\}$ W

14. $x^2 + 10x - 4 = 0$ $\{-5 \pm \sqrt{29}\}$ T

15. $x^2 + 6x + 7 = 0$ $\{-3 \pm \sqrt{2}\}$ G

16. $x^2 - 16x - 1 = 0$ $\{8 \pm \sqrt{65}\}$ Q

17. $x^2 + 12x + 25 = 0$ $\{-6 \pm \sqrt{11}\}$ A

S U P E R C A U L I F L O W E R
2 9 11 10 6 1 17 9 8 12 5 8 4 13 10 6

C H E E S E B U T E G G S W E R E
1 3 10 10 2 10 7 9 14 10 15 15 2 13 10 6 10

Q U I T E A T R O C I O U S
16 9 12 14 10 17 14 6 4 1 12 4 9 2

KEY

A	B	C	E	F
$\{-6 \pm \sqrt{11}\}$	$\{-5 \pm \sqrt{46}\}$	$\{3 \pm \sqrt{7}\}$	$\{1 \pm \sqrt{3}\}$	$\{-2 \pm \sqrt{17}\}$
G	H	I	L	O
$\{-3 \pm \sqrt{2}\}$	$\{-3 \pm \sqrt{13}\}$	$\{-2 \pm \sqrt{10}\}$	$\{-1 \pm \sqrt{6}\}$	$\{-3 \pm \sqrt{7}\}$
P	Q	R	S	T
$\{2 \pm \sqrt{7}\}$	$\{8 \pm \sqrt{65}\}$	$\{7 \pm \sqrt{93}\}$	$\{6 \pm \sqrt{46}\}$	$\{-5 \pm \sqrt{29}\}$
U	W			
$\{-1 \pm \sqrt{2}\}$	$\{-4 \pm \sqrt{14}\}$			