Warm-up Not In Notes

$16x + 2x =$

$16 + 2x$

18

Is $16+2\sqrt{10}=18\sqrt{10}$?
Prove to your neighbor why or why not.

Not true because the left side cannot be combined...no like terms

$$(16+2)\sqrt{10} = 18\sqrt{10}$$

$$16\sqrt{10}+2\sqrt{10} = 18\sqrt{10}$$

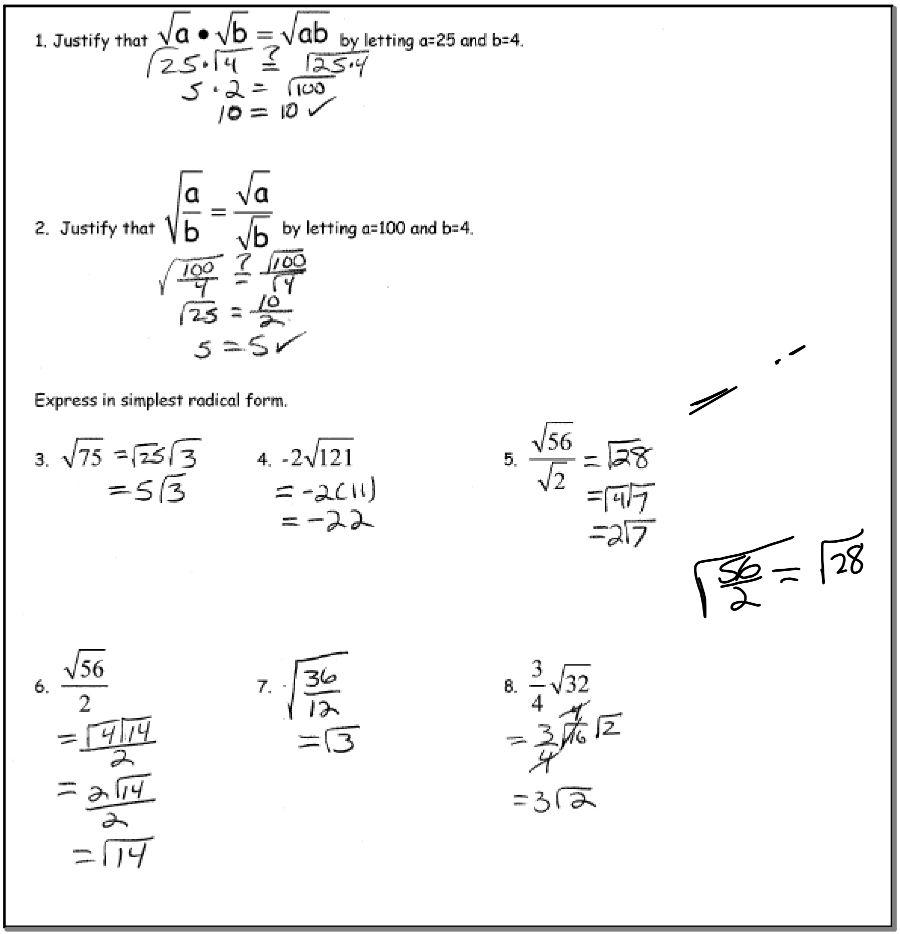
Aug 15-10:55 AM

1-10 HW Answer Key

1 & 2. Look at next page

3. $5\sqrt{3}$
4. -22
5. $2\sqrt{7}$
6. $\sqrt{14}$
7. $\sqrt{3}$
8. $3\sqrt{2}$
9. 64, 8
10. 16, 4
11. 48, $4\sqrt{3}$
12. 117, $3\sqrt{13}$
13. 3x(2x-5)(x+2)
14. {0, 5, -2}
15. $(2x+5)(4x^2-10x+25)$

Aug 28-12:25 PM



1. Justify that $\sqrt{a}\bullet\sqrt{b}=\sqrt{ab}$ by letting a=25 and b=4.

$\sqrt{25}\cdot\sqrt{4}\overset{?}{=}\sqrt{25\cdot4}$

$5\cdot2=\sqrt{100}$

$10=10$ ✓

2. Justify that $\sqrt{\frac{a}{b}}=\frac{\sqrt{a}}{\sqrt{b}}$ by letting a=100 and b=4.

$\sqrt{\frac{100}{4}}\overset{?}{=}\frac{\sqrt{100}}{\sqrt{4}}$

$\sqrt{25}=\frac{10}{2}$

$5=5$ ✓

Express in simplest radical form.

3. $\sqrt{75}=\sqrt{25}\sqrt{3}$

$=5\sqrt{3}$

4. $-2\sqrt{121}$

$=-2(11)$

$=-22$

5. $\frac{\sqrt{56}}{\sqrt{2}}=\sqrt{28}$

$=\sqrt{4}\sqrt{7}$

$=2\sqrt{7}$

$\sqrt{\frac{56}{2}}=\sqrt{28}$

6. $\frac{\sqrt{56}}{2}$

$=\frac{\sqrt{4}\sqrt{14}}{2}$

$=\frac{2\sqrt{14}}{2}$

$=\sqrt{14}$

7. $\sqrt{\frac{36}{12}}$

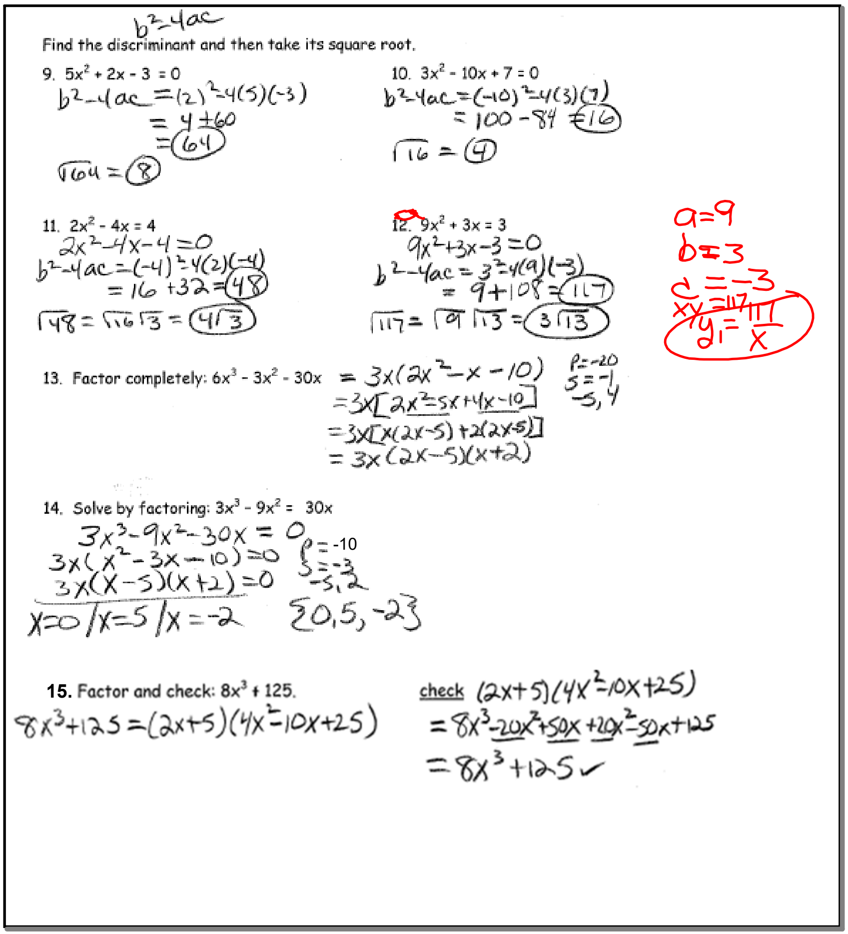
$=\sqrt{3}$

8. $\frac{3}{4}\sqrt{32}$

$=\frac{3}{\cancel{4}}\overset{4}{\cancel{\sqrt{16}}}\sqrt{2}$

$=3\sqrt{2}$

Sep 1-4:32 PM



b^2-4ac

Find the discriminant and then take its square root.

9. $5x^2+2x-3=0$

$b^2-4ac=(2)^2-4(5)(-3)$

$=4+60$

$=\boxed{64}$

$\sqrt{64}=\boxed{8}$

10. $3x^2-10x+7=0$

$b^2-4ac=(-10)^2-4(3)(7)$

$=100-84=\boxed{16}$

$\sqrt{16}=\boxed{4}$

11. $2x^2-4x=4$

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

$b^2-4ac=(-4)^2-4(2)(-4)$

$=16+32=\boxed{48}$

$\sqrt{48}=\sqrt{16}\sqrt{3}=\boxed{4\sqrt{3}}$

12. $9x^2+3x=3$

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

$b^2-4ac=3^2-4(9)(-3)$

$=9+108=\boxed{117}$

$\sqrt{117}=\sqrt{9}\sqrt{13}=\boxed{3\sqrt{13}}$

$a=9$

$b=3$

$c=-3$

$xy=117$

$\boxed{y_1=\frac{117}{x}}$

13. Factor completely: $6x^3-3x^2-30x$ $=3x(2x^2-x-10)$

$P=-20$

$S=-1$

$-5,4$

$=3x[2x^2-5x+4x-10]$

$=3x[x(2x-5)+2(2x-5)]$

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

14. Solve by factoring: $3x^3-9x^2=30x$

$3x^3-9x^2-30x=0$

$P=-10$

$S=-3$

$-5,2$

$3x(x^2-3x-10)=0$

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

$x=0$ | $x=5$ | $x=-2$

$\{0,5,-2\}$

15. Factor and check: $8x^3+125$.

$8x^3+125=(2x+5)(4x^2-10x+25)$

check $(2x+5)(4x^2-10x+25)$

$=8x^3-20x^2+50x+20x^2-50x+125$

$=8x^3+125$ ✓

Sep 1-4:33 PM

Requiz by end of week

Thursday Quiz 2 (Days 4-9)

Monday Quiz 3 (Days 11-12)

Next Wednesday Test

Tues 9/24 1st Math League Meeting in LGR 2:30pm

Sep 17-10:09 PM

1-11: Solve Quadratic Equations Using the Quadratic Formula

If we have a quadratic equation that is not easily factorable, we can solve it by using the quadratic formula. Try solving this by factoring: $3x^2 + 5x - 1 = 0$

$P = -3$

$S = 5$

What do you notice?

1, 3

The Quadratic Formula

If $ax^2 + bx + c = 0$ $(a \neq 0)$, then the solutions, or roots, are

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}.$$

discriminant

https://www.youtube.com/watch?v=2lbABbfU6Zc (To music)

http://www.youtube.com/watch?v=O8ezDEk3qCg

http://www.youtube.com/watch?v=z6hCu0EPs-o

You should recognize the expression under the radical = $b^2 - 4ac$.

We call that the discriminant and will find it first.

Let's use the quadratic formula to solve the following equation. Find the discriminant first.

1. $3x^2 + 5x - 1 = 0$ $a = 3, b = 5, c = -1$

$b^2 - 4ac = 5^2 - 4(3)(-1) = 25$ ✓

$25 + 12 = 37$

$$X = \frac{-5 \pm \sqrt{37}}{2(3)} = \left\{ \frac{-5 \pm \sqrt{37}}{6} \right\}$$

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Find the zeros of the functions or the roots of the equations using the quadratic formula. Leave all solutions in simplest radical form.
Note: Some can be solved by factoring, but we will use the quadratic formula.

$ax^2+bx+c=0$

2. $f(x)=x^2+8x+7$

$x^2+8x+7=0$

discim $=b^2-4ac=(8)^2-4(1)(7)$

$=64-28=36$

$x=\frac{-8\pm\sqrt{36}}{2(1)}=\frac{-8\pm6}{2}$

$x=\frac{-8+6}{2}$ | $x=\frac{-8-6}{2}$

$x=\frac{-2}{2}$ | $x=\frac{-14}{2}$

$x=-1$ | $x=-7$

$\{-1,-7\}$

3. $-9=x^2+6x$

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

$b^2-4ac=$

$36-4(1)(9)$

$=36-36$

$=0$

$x=\frac{-6\pm\sqrt{0}}{2(1)}=\frac{-6}{2}=-3$

$\{-3\}$

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4. $3(x-2)^2-4=0$

$(x-2)(x-2)$

$3[x^2-2x-2x+4]-4=0$

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

$3x^2-12x+12-4=0$

$3x^2-12x+8=0$

$b^2-4ac=144-4(3)(8)$

$=144-96$

$=48$

$a=3,\ b=-12,\ c=8$

$x=\frac{--12\pm\sqrt{48}}{2(3)}$

$x=12\pm$

$x=\frac{12\pm\overset{4}{\cancel{\sqrt{16}}}\sqrt{3}}{6}$

$=\frac{12\pm4\sqrt{3}}{6}=\frac{12}{6}\pm\frac{4\sqrt{3}}{6}$

$\div2$ $=\left\{\frac{6\pm2\sqrt{3}}{3}\right\}$

5. $f(x)=2x^2-16x+27$

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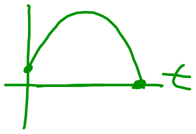
You can use the quadratic formula to solve real-world problems modeled by quadratic functions.

6. In a shot put event, Jenna tosses her last shot from a position of about 6' above the ground with an initial vertical and horizontal velocity of 20 ft/sec. The height of the shot is modeled by the function $h(t) = -16t^2 + 20t + 6$, where t is the time in seconds after the toss. How long does it take the shot to reach the ground? Round to the nearest tenth.

$(-16t^2+20t+6=0)-1$



$* \ \frac{16t^2-20t-6}{2}=\frac{0}{2}$

8

dis cim $= b^2-4ac$

$= (-20)^2$

$= 400-4(16)(-6)$

$= 400+384=784$

$8t^2=10t-3=0$

$t = - \frac{-20 \pm \sqrt{784}}{32}$

$= \frac{(20 \pm \sqrt{784})}{32}$

$t=\frac{20+\sqrt{781}}{32}$

$\cancel{-.25}$

1.5 seconds

Aug 28-12:41 PM

Sep 20-6:28 PM