Bryant- Algebra 2: Chapter 4B Review Name: Mikey

Hour:_____

Solve by factoring.

1. $2b^2 - 2b - 40 = 0$

$2(b^2 - b - 20) = 0$

$2(b-5)(b+4) = 0$

$\boxed{b = 5 \quad b = -4}$

2. $r^2 - 6r + 5 = 0$

$(r-5)(r-1) = 0$

$\boxed{r = 5 \quad r = 1}$

3. $8k^2 = -64k$

$8k^2 + 64k = 0$

$8k(k+8) = 0$

$\boxed{k = 0 \quad k = -8}$

4. $7n^2 + 53n = 24$

-168

$+56 \mid -3$

$7n^2 + 53n - 24 = 0$

$7n^2 - 3n + 56n - 24 = 0$

$n(7n-3) + 8(7n-3) = 0$

$(n+8)(7n-3) = 0$

$\boxed{n = -8 \quad n = 3/7}$

Solve by any method.

5. $5x^2 = 125$

$5x^2 - 125 = 0$

$5(x^2 - 25) = 0$

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

$\boxed{x = -5 \quad x = 5}$

$x^2 = 25$

$x = \pm 5$

6. $5x^2 + 20x + 20 = 0$

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

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

$\boxed{x = -2}$

Solve by using the *quadratic formula*. List the exact answers *and* round to the nearest hundredth.

9. $3x^2 + 4x - 1 = 0$

$$X = \frac{-4 \pm \sqrt{4^2 - 4(3)(-1)}}{2(3)} = \frac{-4 \pm \sqrt{16+12}}{6}$$

$$\boxed{X = \frac{-4+\sqrt{28}}{6} \approx 0.21 \qquad X = \frac{-4-\sqrt{28}}{6} \approx -1.55}$$

Solve by using the quadratic formula.

10. $x^2 - 2x + 15 = 0$

$$X = \frac{2 \pm \sqrt{(-2)^2 - 4(1)(15)}}{2}$$

$$X = \frac{2 \pm \sqrt{4-60}}{2} = \frac{2 \pm \sqrt{-56}}{2}$$

$$\boxed{X = \frac{2 \pm i\sqrt{56}}{2}}$$

11. $x^2 + 3x + 8 = 0$

$$X = \frac{-3 \pm \sqrt{3^2 - 4(1)(8)}}{2}$$

$$X = \frac{-3 \pm \sqrt{9-32}}{2} = \frac{-3 \pm \sqrt{-23}}{2}$$

$$\boxed{X = \frac{-3 \pm i\sqrt{23}}{2}}$$

Write the polynomial (in standard form) that has the given zeros.

12. 0, -8

$X=0 \quad X=-8$

$X=0 \quad X+8=0$

$(x+8)(x)=0$

$\boxed{X^2+8X=0}$

13. 4, –5

$X=4 \quad X=-5$

$X-4=0 \quad X+5=0$

$(X-4)(X+5)=0$

$X^2+5X-4X-20=0$

$\boxed{X^2+X-20=0}$

Find the C-value to complete the square.

14. $x^2 + 20x +$ $\underline{100}$

$\left(\frac{b}{2}\right)^2 \left(\frac{20}{2}\right)^2 = 10^2$

15. $a^2 - 24a +$ $\underline{144}$

$\left(\frac{-24}{2}\right)^2 = (-12)^2$

Solve each equation by completing the square. Write your answer in *radical form* (exact answers) *and* rounded to the nearest *hundredth.*

16. $x^2 - 8x + 10 = -4$

$x^2 - 8x + \underline{64} = -14 + \underline{64}$

$(x-8)^2 = 50$

$x - 8 = \pm\sqrt{50}$

$\boxed{x = 8 \pm \sqrt{50}}$

17. $r^2 - 14r = -45$

$r^2 - 14r + \underline{49} = -45 + \underline{49}$

$(r-7)^2 = 4$

$r - 7 = \pm\sqrt{4}$

$r = -7 \pm 2$

$\boxed{r = -5 \quad r = -9}$

18. A ball is thrown into the air with a velocity of 42 ft/s. Its height in feet after t seconds is given by the function $h(t) = -16t^2 + 42t + 7$.

a) After how many seconds will the ball reach its *maximum* height? Do not round your answer.

$x = \frac{-b}{2a} = \frac{-42}{2(-16)} = \frac{-42}{-32}$

$\boxed{\text{After } 1.3125 \text{ seconds}}$

b) What will that maximum height be?

$h(1.3125) = \boxed{34.56 \text{ feet}}$

c) After how many seconds will the ball hit the ground? Round your answer to the nearest *hundredth.*

$-16t^2 + 42t + 7 = 0$

$t = \frac{-42 \pm \sqrt{42^2 - 4(-16)(7)}}{2(-16)}$ 2212

$t = \frac{-42 + \sqrt{2212}}{-32}$

$t = \frac{-42 - \sqrt{2212}}{-32}$

$t \approx 0.16 \text{ sec}$

$\boxed{t \approx 2.78 \text{ seconds}}$

19. Jack drops his cell phone from atop his beanstock, which is 120 feet tall. To the nearest hundredth of a second, how long will it take the phone to hit the ground?

$h(t) = -16t^2 + 0t + 120$

$0 = -16t^2 + 0t + 120$

$t = \frac{0 \pm \sqrt{0^2 - 4(-16)(120)}}{2(-16)} = \frac{\pm\sqrt{1280}}{-32}$

$t = \frac{\sqrt{1280}}{-32} \approx -1.12s$ $t = \frac{-\sqrt{1280}}{-32}$ $\approx 1.12s$

20. A rectangle has length $x + 3$ and height $2x - 5$.

a) Write a polynomial that represents the area of the rectangle.

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

$A = 2x^2 - 5x + 6x - 15$

$\boxed{A = 2x^2 + x - 15}$

b) For what values of x is this area equal to 63?

$63 = 2x^2 + x - 15$

$0 = 2x^2 + x - 78$

$x = \frac{-1 \pm \sqrt{(1)^2 - 4(2)(-78)}}{2(2)} = \frac{-1 \pm \sqrt{625}}{4}$ 25

$x = \frac{-1+25}{4} = 6$

$x = \frac{-1-25}{4} = -6.5$

c) Do all of your solutions create a reasonable length and height? Justify your answer.

No. When $x = -6.5$ the side length & height would be a negative measure.