8.1 Homework Exponentials Ring

1. $(0,0)$ $r=6$
2. $(2,3)$ $r=7$
3. $(+1,-6)$ $r=4$
4. $(-3,1)$ $r=\sqrt{12}=2\sqrt{3}$
5. $x^2+y^2=49$
6. $(x-4)^2+(y-3)^2=64$
7. $(x-5)^2+(y-3)^2=4$
8. $(x+5)^2+(y-4)^2=1/4$
9. $(x+2)^2+(y+5)^2=2$
10. $(x+1)^2+(y-6)^2=5$

11.

11. $(0,0)$ $r=2$
$$x^2+y^2=4$$

12. $(-3,3)$ $r=1$
$$(x+3)^2+(y-3)^2=1$$

13. $(0,3)$ $r=4$
$$x^2+(y-3)^2=16$$

14. $(7,-2)$ $r=2$
$$(x-7)^2+(y+2)^2=4$$

15. $(0,-20)$ $r=10$
$$x^2+(y+20)^2=100$$

16. $(-4,-6)$ $r=4$
$$(x+4)^2+(y+6)^2=16$$

25. $(x+4)^2+(y+3)^2=4$

17. $(0,0)$ $r=5$
18. $(3,5)$ $r=3$
19. $(-2,-4)$ $r=4$
20. $(-1,1)$ $r=6$

see graphs

21. $(x-0)^2+(y-0)^2=r^2$
$$(3-0)^2+(4-0)^2=r^2$$
$$9+16=r^2$$
$$25=r^2$$
$$x^2+y^2=25$$

22. $(x-5)^2+(y-9)^2=r^2$
$$(2-5)^2+(9-9)^2=r^2$$
$$(-3)^2+(0)^2=r^2$$
$$9=r^2$$
$$(x-5)^2+(y-9)^2=9$$

23. $(x+4)^2+(y+3)^2=r^2$
$$(2+4)^2+(2+3)^2=r^2$$
$$(6)^2+(5)^2=r^2$$
$$36+25=r^2$$
$$61=r^2$$
$$(x+4)^2+(y+3)^2=61$$

24. $(x-7)^2+(y+2)^2=r^2$
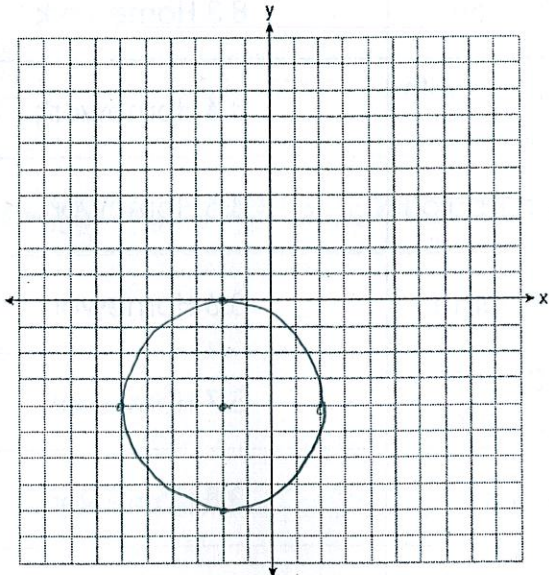$$(-1-7)^2+(-6+2)^2=r^2$$
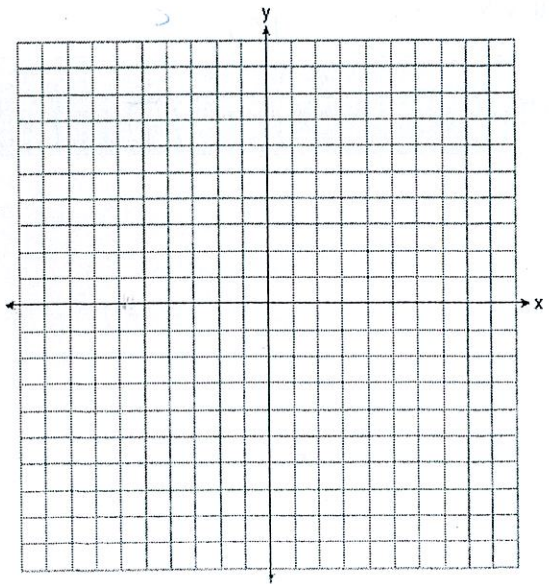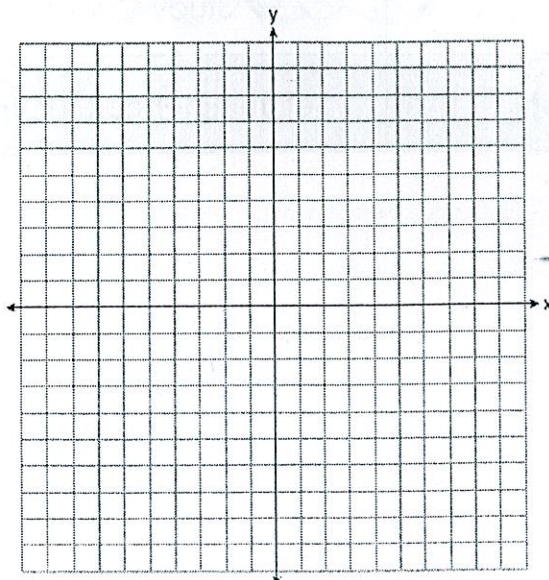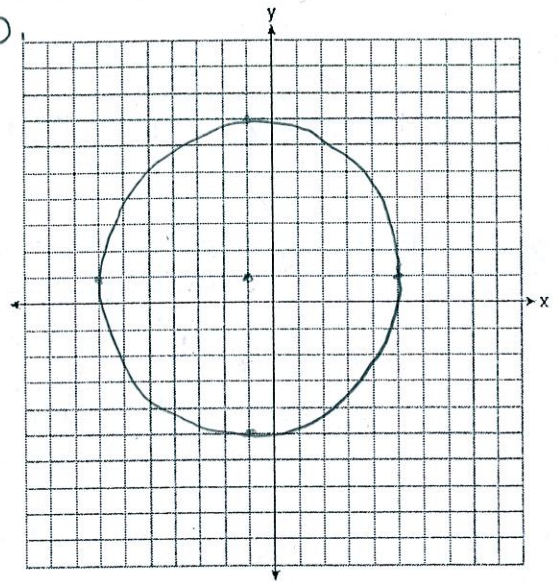$$(-8)^2+(-4)^2=r^2$$
$$64+16=r^2$$
$$80=r^2$$

17.
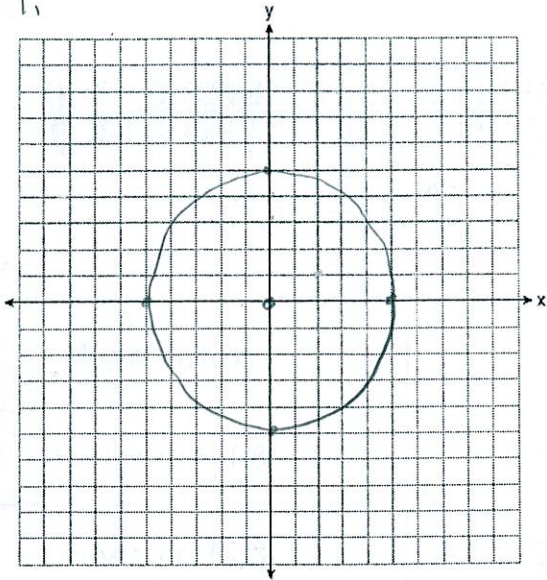
18.
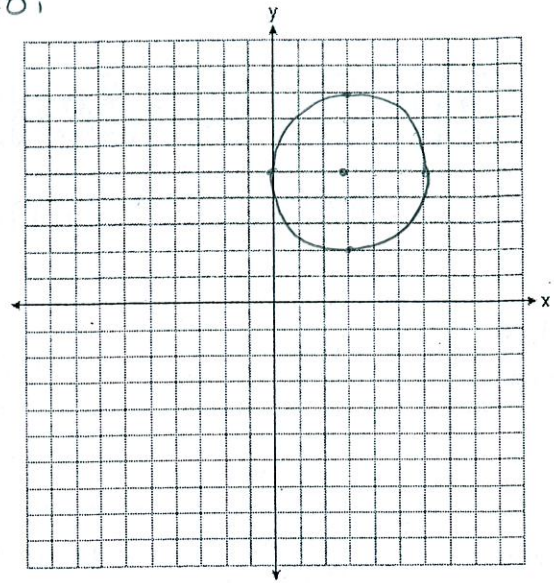
19.)

20.

8.2 Homework #2-10 even

2. $x^2 + 8x + y^2 = 3 - 15$

$x^2 + 8x + \left(\frac{8}{2}\right)^2 + y^2 = -12 + \left(\frac{8}{2}\right)^2$ center: $(-4, 0)$

$x^2 + 8x + 16 + y^2 = -12 + 16$ Radius: 2

$(x + 4)^2 + y^2 = 4$

4. $x^2 - 6x + y^2 - 4y = 27 - 15$

$x^2 - 6x + \left(\frac{-6}{2}\right)^2 + y^2 - 4y + \left(\frac{-4}{2}\right)^2 = 12 + \left(\frac{-6}{2}\right)^2 + \left(\frac{-4}{2}\right)^2$

$x^2 - 6x + 9 + y^2 - 4y + 4 = 12 + 9 + 4$ center: $(3, 2)$

$(x - 3)^2 + (y - 2)^2 = 25$ Radius: 5

6. $x^2 + 4x + y^2 + 2y = 59$

$x^2 + 4x + \left(\frac{4}{2}\right)^2 + y^2 + 2y + \left(\frac{2}{2}\right)^2 = 59 + \left(\frac{4}{2}\right)^2 + \left(\frac{2}{2}\right)^2$

$x^2 + 4x + 4 + y^2 + 2y + 1 = 59 + 4 + 1$ center: $(-2, -1)$

$(x + 2)^2 + (y + 1)^2 = 64$ radius: 8

8. $x^2 + 6x + y^2 + 4y = 3$

$x^2 + 6x + \left(\frac{6}{2}\right)^2 + y^2 + 4y + \left(\frac{4}{2}\right)^2 = 3 + \left(\frac{6}{2}\right)^2 + \left(\frac{4}{2}\right)^2$

$x^2 + 6x + 9 + y^2 + 4y + 4 = 3 + 9 + 4$ center: $(-3, -2)$

$(x + 3)^2 + (y + 2)^2 = 16$ Radius: 4

10. $x^2 + 4x + y^2 - 8y = -19.36$

$x^2 + 4x + \left(\frac{4}{2}\right)^2 + y^2 - 8y + \left(\frac{-8}{2}\right)^2 = -19.36 + \left(\frac{4}{2}\right)^2 + \left(\frac{-8}{2}\right)^2$

$x^2 + 4x + 4 + y^2 - 8y + 16 = -19.36 + 4 + 16$

$(x + 2)^2 + (y - 4)^2 = 0.64$

center: $(-2, 4)$

8.3 Homework

Name_____
Period_____

Dividing Polynomials Using Synthetic Division

Use synthetic division to divide the polynomial by the linear factor.

1. $(3x^2 + 7x + 2) \div (x + 2)$

$$-2 \, \rfloor \begin{array}{ccc} 3 & 7 & 2 \\ \downarrow & -6 & -2 \\ \hline 3 & 1 & \boxed{0} \end{array}$$

$3x + 1$

2. $(2x^2 + 7x - 15) \div (x + 5)$

$$-5 \, \rfloor \begin{array}{ccc} 2 & 7 & -15 \\ \downarrow & -10 & 15 \\ \hline 2 & -3 & \boxed{0} \end{array}$$

$2x - 3$

3. $(7x^2 - 3x + 5) \div (x + 1)$

$$-1 \, \rfloor \begin{array}{ccc} 7 & -3 & 5 \\ \downarrow & -7 & 10 \\ \hline 7 & -10 & \boxed{15} \end{array}$$

$7x - 10 + \dfrac{15}{x+1}$

4. $(4x^2 + x + 1) \div (x - 2)$

$$2 \, \rfloor \begin{array}{ccc} 4 & 1 & 1 \\ \downarrow & 8 & 18 \\ \hline 4 & 9 & \boxed{19} \end{array}$$

$4x + 9 + \dfrac{19}{x-2}$

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

5. $(3x^2 + 4x - x^4 - 2x^3 - 4) \div (x + 2)$

$$-2 \, \rfloor \begin{array}{ccccc} -1 & -2 & 3 & 4 & -4 \\ \downarrow & 2 & 0 & -6 & 4 \\ \hline -1 & 0 & 3 & -2 & \boxed{0} \end{array}$$

$-1x^3 + 0x^2 + 3x - 2$

or

$-1x^3 + 3x - 2$

6. $(3x^2 - 4 + x^3) \div (x - 1) \rightarrow x^3 + 3x^2 + 0x - 4$

$$1 \, \rfloor \begin{array}{cccc} 1 & 3 & 0 & -4 \\ \downarrow & 1 & 4 & 4 \\ \hline 1 & 4 & 4 & \boxed{0} \end{array}$$

$1x^2 + 4x + 4$

7. $(x^4 + 1) \div (x + 1)$

$$\underline{-1}\,\lfloor\ 1\quad 0\quad 0\quad 0\quad 1$$
$$\downarrow\ -1\quad 1\quad -1\quad 1$$
$$\overline{1\quad -1\quad 1\quad -1\ \lfloor 2\rfloor}$$

$$x^3 - 1x^2 + 1x - 1 + \frac{2}{x+1}$$

$x^4 + 0x^3 + 0x^2 + 0x - 16$

9. $(x^4 - 16) \div (x + 2)$

$$\underline{-2}\,\lfloor\ 1\quad 0\quad 0\quad 0\quad -16$$
$$\downarrow\ -2\quad 4\quad -8\quad 16$$
$$\overline{1\quad -2\quad 4\quad -8\ \lfloor 0\rfloor}$$

$$x^3 - 2x^2 + 4x - 8$$

8. $(x^4 + 9) \div (x + 3)$

$$\underline{-3}\,\lfloor\ 1\quad 0\quad 0\quad 0\quad 9$$
$$\downarrow\ -3\quad 9\quad -27\quad 81$$
$$\overline{1\quad -3\quad 9\quad -27\ \lfloor 90\rfloor}$$

$$x^3 - 3x^2 + 9x - 27 + \frac{90}{x+3}$$

10. $\dfrac{x^6 + 4x^5 - 2x^3 + 7}{x + 1}$

$$\underline{-1}\,\lfloor\ 1\quad 4\quad 0\quad -2\quad 0\quad 0\ \lfloor 7$$
$$\downarrow\ -1\quad -3\quad 3\quad -1\quad 1\quad -1$$
$$\overline{1\quad 3\quad -3\quad 1\quad -1\quad 1\ \lfloor 6\rfloor}$$

$$x^5 + 3x^4 - 3x^3 + 1x^2 - 1x + 1 + \frac{6}{x+1}$$

8.4   #3, 4, 7-12, 15-20

3. Total: 5
   Real: 1
   Imaginary: 4

4. Total: 3
   Real: 3
   Imaginary: 0

7. $-i$

8. $-1-i, -\sqrt{5}$

9. $-3-\sqrt{5}, i$

10. $-2-\sqrt{10}$

11. $-2-\sqrt{5}$

12. $2+2i$

15. $x=0 \quad x=2 \quad x=\sqrt{3}$
   $x=0 \quad x-2=0 \quad x^2=3$
   $x=0 \quad x-2=0 \quad x^2-3=0$
   $x(x-2)(x^2-3)=0$
   $(x^2-2x)(x^2-3)=0$
   $x^4-3x^2-2x^3+6x=0$
   $\boxed{x^4-2x^3-3x^2+6x=0}$

16. $x=-5 \quad x=\sqrt{3}$
   $x+5=0 \quad x^2=3$
   $x+5=0 \quad x^2-3=0$
   $(x+5)(x^2-3)=0$
   $x^3-3x+5x^2-15=0$
   $\boxed{x^3+5x^2-3x-15=0}$

17. $x=-1 \quad x=(2i)^2$
   $x+1=0 \quad x^2=-4$
   $x+1=0 \quad x^2+4=0$
   $(x+1)(x^2+4)=0$
   $x^3+4x+1x^2+4=0$
   $\boxed{x^3+1x^2+4x+4=0}$

18. $x=2i \quad x=2+2i$
   $x^2=-4 \quad x-2=2i$
   $x^2+4=0 \quad (x-2)^2=-4$
   $x^2+4=0 \quad (x-2)(x-2)=-4$
   $\qquad\qquad x^2-4x+4=-4$
   $\qquad\qquad x^2-4x+8=0$
   $(x^2+4)(x^2-4x+8)=0$
   $x^4-4x^3+8x^2+4x^2-16x+32$
   $\boxed{x^4-4x^3+12x^2-16x+32=0}$

19. $\quad x = -2i \qquad\qquad x = 2 + 2\sqrt{2}$

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

$\qquad x^2 + 4 = 0 \qquad\quad (x-2)(x-2) = 8$

$\qquad x^2 + 4 = 0 \qquad\quad x^2 - 4x + 4 = 8$

$\qquad\qquad\qquad\qquad\quad x^2 - 4x - 4 = 0$

$\qquad (x^2 + 4)(x^2 - 4x - 4) = 0$

	x^2	$-4x$	-4
x^2	x^4	$-4x^3$	$-4x^2$
4	$4x^2$	$-16x$	-16

==$x^4 - 4x^3 - 16x - 16 = 0$==

20. $\quad x = \sqrt{6} \qquad\qquad x = -3 + \sqrt{5}$

$\qquad x^2 = 6 \qquad\qquad (x+3)(x+3) = 5$

$\qquad x^2 - 6 = 0 \qquad\quad x^2 + 6x + 9 = 5$

$\qquad x^2 - 6 = 0 \qquad\quad x^2 + 6x + 4 = 0$

$\qquad (x^2 - 6)(x^2 + 6x + 4) = 0$

	x^2	$+6x$	$+4$
x^2	x^4	$6x^3$	$4x^2$
-6	$-6x^2$	$-36x$	-24

==$x^4 + 6x^3 - 2x^2 - 36x - 24 = 0$==

8.5 volume → Evens.

2. $V = \dfrac{(40)(35)(42)}{2} = 29400 \text{ in}^3$

4. $V = \dfrac{\pi (19)^2 (41)}{3} = 1549.71 \text{ m}^3$

6. $V = \pi (18)^2 (37) = 37642.32 \text{ ft}^3$

8. $V = \dfrac{(25)(20)(39)}{2} = 9750 \text{ m}^3$

〜〜〜〜〜〜〜〜〜〜〜〜〜〜〜

2. $1728 = \dfrac{4\pi r^3}{3}$ $216 = \dfrac{4\pi r^3}{3}$

ratio

$5184 = 12.56 r^3$ $648 = 12.56 r^3$ $7.5 : 3.7$

$r^3 = 412.7$ $r^3 = 51.6$

$r = 7.5$ $r = 3.7$

4. $V = s^3$ $\text{Volume} = (9)(8)$

   $V = (2)^3 = 8$ $\underline{\text{Volume} = 72 \text{ m}^3}$

6. $V = (12)(28)(10) = 3360$

8. $V = (10)(12)(18)$ $(b)(b)(15) = 2160$ $\underline{\text{Length}: 12}$

   $V = 2160 \text{ units}^3$ $15b^2 = 2160$ $\underline{\text{Width}: 12}$

                     $b^2 = 144$

                     $b = 12$

10. $V = \pi (12)^2 (21)$

    $V = 9495.36 \text{ in}^3$

Population Density Worksheet

Directions: Now that you understand the concept of population density, use a calculator to figure out the population density of the places below. Answer all the questions below to the best of your ability.

1. What is the population density of China? __228.1__ people per square mile $\frac{1321851888}{5795162}$
Population: 1,321,851,888
Area: 5,795,162 square miles

2. What is the population density of the U.S.? __52.9__ people per square mile $\frac{301139947}{5692955}$
Population: 301,139,947
Area: 5,692,955 square miles

3. What is the population density of Monaco? __27225.8__ people per square mile $\frac{32671}{1.2}$
Population: 32,671
Area: 1.2 square miles

4. What is the population density of Canada? __8.6__ people per square mile $\frac{33056500}{3854085}$
Population: 33,056,500
Area: 3,854,085 square miles

5. Which of the four countries above has the highest population density? Which has the lowest?
Highest -   Lowest -

6. Which country has the largest land area? Which has the smallest?
Largest - Manaco   Smallest - Canada

7. What is the population density of Wyoming ? __5.05__ people per square mile $\frac{493782}{97818}$
Population: 493,782
Area: 97,818 square miles

8. What is the population density of Pennsylvania ? __266.7__ people per square mile $\frac{12281054}{46055}$
Population: 12,281,054
Area: 46,055 square miles

9. Which state has a higher population density? Pennsylvania or Wyoming?
   Pennsylvania

Now turn to pages A10-A11 in your textbook. Look at the population density map and answer the questions below.
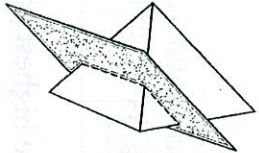
10. Which two countries appear to have the largest areas of high population density? (Hint: If you don't know which countries they are look at the world map on pages A4-A5 to find out.)

11. The area around which city in the United States seems to have the highest population density?

ıme _____ Date _____

ass/Grade _____

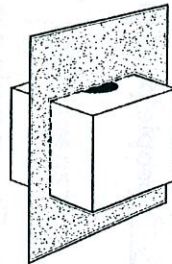A square pyramid is cut along the shaded plane shown below.

Which of the following is the cross-section of this solid?

Ⓐ

Ⓑ

Ⓒ

Ⓓ

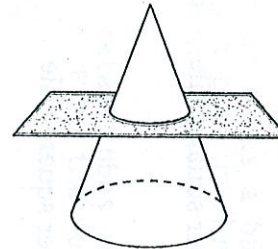**2** A cube with a cylinder cut from its center is cut along the plane shown below.

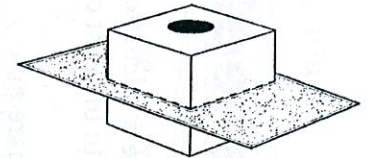Which of the following is the cross-section of this solid?

Ⓕ

Ⓗ

Ⓖ

Ⓙ

3 A cross-section is cut from the circular cone below.

What is the shape of the cross-section?

Ⓐ Square

Ⓑ Semicircle

Ⓒ Triangle

Ⓓ Circle

4 A cube with a cylinder cut from its center is cut along the plane shown below.

Which of the following is the cross-section of this solid?

Ⓕ

Ⓗ

Ⓖ

Ⓙ