Unit 1 Practice

1. (a) the team loses the championship game (b) 0.33

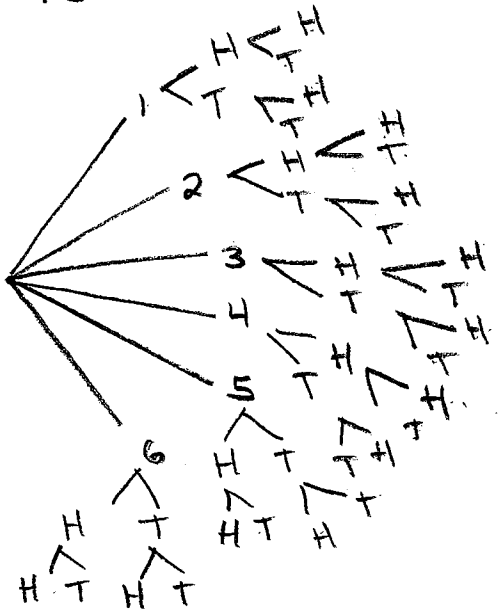
2. (a) $5! = 120$ (b) $5 \cdot 4 \cdot 3 = 60$ (c) $2 \cdot 4 \cdot 3 = 24$
   (d) $5 \cdot 5 \cdot 5 = 125$

3. (a) $8!/2! = 20{,}160$ (b) $11!/(2!2!2!) = 4{,}989{,}600$
   (c) $9!/(2!2!) = 90{,}720$

4. (a) $13C5 = 1287$ (b) $8P2 = 56$ (c) $5C2 \cdot 8C3 = 10 \cdot 56 = 560$

5. (a) $2/6$ or $1/3$ (b) $5/6$ (c) $1/6 \cdot 3/6 = 3/36 = 1/12$
   (d) $2/6 \cdot 1/6 + 1/6 \cdot 2/6 = 2/36 + 2/36 = 4/36 = 1/9$

6. (a)



(b) 9

(c) $8 + 3 = 11$

(d) $\frac{12}{24} = \frac{1}{2}$

7. (a) $\frac{5}{11} \cdot \frac{4}{10} = \frac{20}{110} = \frac{2}{11}$ (b) $\frac{5}{11} \cdot \frac{6}{10} = \frac{30}{110} = \frac{3}{11}$

   (c) $\frac{5}{11} \cdot \frac{6}{10} + \frac{6}{11} \cdot \frac{5}{10} = \frac{30}{110} + \frac{30}{110} = \frac{60}{110} = \frac{6}{11}$ (d) 0

8. (a) $\frac{98}{160} = \frac{49}{80}$

   (b) $\frac{61}{160}$

   (c) $\frac{29}{62}$

Unit 2 Practice

1.

$x^2-5x-24$ $(x-8)(x+3)$	$3x^2-6x-45$ $3(x^2-2x-15)$ $3(x-5)(x+3)$	$2x^2-x-3$ $(2x-3)(x+1)$
x^2-25 $(x-5)(x+5)$	$4x^2-81y^2$ $(2x+9y)(2x-9y)$	$x^3+5x^2-9x-45$ $x^2(x+5)-9(x+5)$ $(x+3)(x-3)(x+5)$

2.

$2y = 8-x$
$y = 2x-1$

$2(2x-1) = 8-x$
$4x-2 = 8-x$
$5x = 10$
$x = 2$
$y = 2(2)-1$
$y = 3$
$(2,3)$

$-2(3x-5y=-6)$
$3(2x-3y=-5)$

$-6x+10y = 12$
$6x-9y = -15$

$y = -3$
$3x-5(-3) = -6$
$3x+15 = -6$
$3y = -21$
$y = -7$
$(-3,-7)$

3. $6x^3-4x^2 = 2x$
$6x^3-4x^2-2x = 0$
$2x(3x^2-2x-1) = 0$
$2x(3x+1)(x-1) = 0$
$x=0$ | $x=-1/3$ | $x=1$

$\frac{x-5}{4} = \frac{-3}{x+3}$
$(x-5)(x+3) = -12$
$x^2-2x-15 = -12$
$x^2-2x-3 = 0$
$(x-3)(x+1) = 0$
$x=3, x=-1$

4. $\frac{3x^7}{yz}$

$\frac{4x^{-8}y^{-4}}{4y^6x^{-4}} = \frac{1}{x^4y^{10}}$

$\frac{16x^8y^{-2}}{8x^3y} = \frac{2x^5}{y^3}$

5. $x-9=0$
$x=9$

$x^2-9=0$
$(x+3)(x-3)=0$
$x=-3, x=3$

$x^2-3x-10=0$
$(x-5)(x+2)=0$
$x=5, x=-2$

6. $\frac{x^2-x-6}{2x^2-18} = \frac{(x-3)(x+2)}{2(x+3)(x-3)} = \frac{x+2}{2(x+3)}$

Unit 2 Practice

6(continued).

$$\frac{x^3+2x^2-24x}{x^2+x-20} = \frac{x(x^2+2x-24)}{(x+5)(x-4)} = \frac{x(x+6)(x-4)}{(x+5)(x-4)} = \boxed{\frac{x(x+6)}{x+5}}$$

7. $$\frac{(x-10)(x+1)}{2x(x+1)} \cdot \frac{x(x+10)(x-2)}{(10-x)(10+x)} = \boxed{\frac{-1(x-2)}{2}}$$

$$\frac{(x+3)(x-3)}{(x+6)(x-3)} \cdot \frac{(x+6)(x+2)}{(x+3)(x-2)} = \boxed{\frac{x+2}{x-2}}$$

$$\frac{x+2}{x+5}\,{}^{(x)} + \frac{3}{x(x+5)} = \frac{x^2+2x+3x+15}{x(x+5)} = \boxed{\frac{x^2+5x+15}{x(x+5)}}$$

$$\frac{x+3}{x-2}\,{}^{(x-5)} - \frac{7}{x-5}\,{}^{(x-2)} = \frac{x^2-5x+3x-15-(7x-2)}{(x-2)(x-5)} = \boxed{\frac{x^2-9x-13}{(x-2)(x-5)}}$$

8. $$\frac{1}{2x^2}\,{}^{(3)} - \frac{x+3}{x^2}\,{}^{(6)} = \frac{1}{3x^2}\,{}^{(2)}$$

$$3-6x-18=2$$

$$-6x=17$$

$$\boxed{x=-\frac{17}{6}}$$

$$\frac{1}{x} = \frac{x+6}{x+7} + \frac{1}{x+7}$$

$$\frac{1(x+7)}{x(x+7)} = \frac{x(x+6)}{x(x+7)} + \frac{1(x)}{(x)(x+7)}$$

$$x+7 = x^2+6x+x$$

$$0 = x^2+6x-7$$

$$0 = (x+7)(x-1)$$

$x \neq -7$ reject, $\boxed{x=1}$

$$\frac{x-2}{x-1} = 6 + \frac{x^2+2x-8}{x^2-6x+5}$$

$$\frac{x-2}{x-1} = \frac{6}{1} + \frac{(x+4)(x-2)}{(x-5)(x-1)}$$

$$(x-2)(x-5) = 6(x-5)(x-1) + (x+4)(x-2)$$

$$x^2-7x+10 = 6(x^2-6x+5) + x^2+2x-8$$

$$x^2-7x+10 = 6x^2-36x+30+x^2+2x-8$$

$$0 = 6x^2-27x+12$$

$$6x^2-27x+12=0$$

$$2x^2-9x+4=0$$

$$(2x-1)(x-4)=0$$

$$x=\frac{1}{2} \quad x=4$$

$$\boxed{\left\{\frac{1}{2}, 4\right\}}$$

Unit 3 Practice

1. (a) $p \wedge q$ (b) $p \vee q$ (c) $p \rightarrow q$ (d) $p \leftrightarrow q$

2. (a) True (c) uncertain
   (b) False (d) True

3. (a) If I earn good grades, then I do my HW.
   (b) If I do not do my HW, then I will not earn good grades.
   (c) If I will not earn good grades, then I do not do my HW.

4. Rich likes baseball; Law of Disj. Inf.

   If I get a job afterschool, then I won't join a club; Law of Contrapositive.

   I go to the gym; Law of Detachment.

5. $(q \rightarrow \sim p) \leftrightarrow \sim(p \wedge q)$

p	q	$\sim p$	$\sim q$	$q \rightarrow \sim p$	$p \wedge q$	$\sim(p \wedge q)$	$(q \rightarrow \sim p) \leftrightarrow \sim(p \wedge q)$
T	T	F	F	F	T	F	T
T	F	F	T	T	F	T	T
F	T	T	F	T	F	T	T
F	F	T	T	T	F	T	T

yes, all true!

6.

Statements	Reasons
1. $\sim(\sim a \wedge b)$	1. given
2. b	2. given
3. $a \vee \sim b$	3. DeMorgan's Law (1)
4. a	4. Law of Disj Inf (2, 3)
5. $c \rightarrow \sim a$	5. given
6. $a \rightarrow \sim c$	6. Law of Contrapositive (5)
7. $\sim c$	7. Law of Detachment (4, 6)
8. $\sim c \rightarrow d$	8. given
9. d	9. Law of Detachment (7, 8)

Unit 4 Practice

1. $2x-10+5x+50=110$
   $7x+40=110$
   $7x=70$
   $\boxed{x=10}$

   $\boxed{ST=10,\ TU=100}$

2. $9x-9+4x+16=124$
   $13x+7=124$
   $13x=117$
   $\boxed{x=9}$

   $\boxed{m\angle RSU=72^\circ,\ m\angle UST=52^\circ,\ m\angle RST=124^\circ}$

3. $8x+15=3x+60$
   $5x=45$
   $\boxed{x=9}$

   $\boxed{m\angle QRT=m\angle SRT=87^\circ,\ m\angle QRS=174^\circ}$

4. $16-2x=8x-14$
   $30=10x$
   $\boxed{3=x}$

   $\boxed{XY=YZ=10,\ XZ=20}$

5. $6x-7+7x+5=180$
   $13x-2=180$
   $13x=182$
   $\boxed{x=14}$

   $\boxed{m\angle CJL=77^\circ}$

6. $x^2+5x=4x+110$
   $x^2+x-110=0$
   $(x+11)(x-10)=0$
   $x\neq -11 \quad x=10$
   $m\angle Q=4(10)=\boxed{40^\circ}$

7. $3x+1+4x-7+5x-20=180$
   $12x-36=180$
   $12x=216$
   $x=18$
   $m\angle A=55^\circ, m\angle B=55, m\angle C=70^\circ$

   $\boxed{\text{acute, isosceles}}$

8. $2x+7x=180$
   $9x=180$
   $x=20$
   $2(20)=\boxed{40^\circ}$

9. (a) $\triangle WXB, \triangle ZYC$
   (b) $\overleftrightarrow{AB}, \overleftrightarrow{YX}$
   (c) $\overline{AB}, \overline{CB}$

10. $5+11=16$
    $11-5=6$

    $\boxed{7, 8, 9, 10, 11, 12, 13, 14, 15}$

Unit 5 Practice

1. (a)
2. (d)
3. (a)

4.

Statements	Reasons
1. $\overline{QP} \perp \overline{PM}$, $\overline{NM} \perp \overline{MP}$	1. given
2. $\angle P$, $\angle M$ are right $\measuredangle$s	2. $\perp$ lines form right $\measuredangle$s
3. $\angle P \cong \angle M$	3. right $\measuredangle$s $\cong$
4. R midpt of $\overline{PM}$	4. given
5. $\overline{PR} \cong \overline{MR}$	5. def of midpt.
6. $\angle QRP \cong \angle MRN$	6. vertical $\measuredangle$s $\cong$
7. $\triangle PQR \cong \triangle MNR$	7. ASA $\cong$ ASA

Statements	Reasons
1. $\overline{DC} \parallel \overline{AB}$	1. given
2. $\angle D \cong \angle B$, $\angle C \cong \angle A$	2. if 2 $\parallel$ lines are cut by a trans., alt int $\measuredangle$s $\cong$
3. $\overline{DB}$ bisects $\overline{AC}$ at E	3. given
4. $\overline{CE} \cong \overline{AE}$	4. def of seg. bisector
5. $\triangle DCE \cong \triangle BAE$	5. AAS $\cong$ AAS
6. $\overline{DC} \cong \overline{AB}$	6. CPCTC

Statements	Reasons
1. $\overline{BC} \cong \overline{AD}$	1. given
2. E midpt of $\overline{BA}$	2. given
3. $\overline{BE} \cong \overline{AE}$	3. def of midpt.
4. $\angle ECD \cong \angle EDC$	4. given
5. $\overline{EC} \cong \overline{ED}$	5. if 2 $\measuredangle$s are $\cong$, opp sides are $\cong$.
6. $\triangle BCE \cong \triangle ADE$	6. SSS

Statements	Reasons
1. $\overline{PB} \cong \overline{EA}$	1. given
2. $\overline{AB} \cong \overline{AB}$	2. reflexive prop.
3. $\overline{PB} - \overline{AB} \cong \overline{EA} - \overline{AB}$	3. subtraction prop.
4. $\overline{PA} \cong \overline{EB}$	4. substitution prop.
5. $\overline{PQ} \parallel \overline{ED}$	5. given
6. $\angle P \cong \angle E$	6. if 2 $\parallel$ lines are cut by a trans, alt int $\measuredangle$s.
7. $\overline{QA} \perp \overline{PB}$, $\overline{DB} \perp \overline{EA}$	7. given — $\perp$ lines form right $\measuredangle$s
8. $\angle PAQ \cong \angle EBD$ ($\angle PAQ$ and $\angle EBD$ are right $\measuredangle$s)	8. right $\measuredangle$s are $\cong$
9. $\triangle QPA \cong \triangle DEB$	9. AAS $\cong$ AAS
10. $\overline{QA} \cong \overline{DB}$	10. CPCTC

Unit 6 Practice

1. $\frac{360}{6} = 60^\circ$

2. $180(9-2) = 1260^\circ$

   $\frac{1260}{9} = 140^\circ$

3. $5x+7 = 6x-1$

   $\boxed{8 = x}$

4. $4x+20+3x-15 = 180$

   $7x+5 = 180$

   $7x = 175$

   $x = 25$

   $\boxed{m\angle D = 60^\circ}$

5. $2(7x-6) = 6x+4$

   $14x-12 = 6x+4$

   $8x = 16$

   $\boxed{x = 2}$

6. $x^2+6x = x+14$

   $x^2+5x-14 = 0$

   $(x+7)(x-2) = 0$

   $12-1 = \boxed{11}$

7. $2x+12+5x = 180$

   $7x = 168$

   $x = 24$

   $5(24) = 120^\circ$

8. $3^2+4^2 = c^2$

   $c^2 = 25$

   $c = \boxed{5}$

9. $x+7+3x+11 = 2(25)$

   $4x+18 = 50$

   $4x = 32$

   $\boxed{x = 8}$

Statements	Reasons
1. BEDF ▱, $\overline{AEB}$, $\overline{CFD}$	1. given
2. $\angle BED \cong \angle BFD$	2. opp $\measuredangle$s of ▱ $\cong$
3. $\angle AED \cong \angle CFD$	3. supp of $\cong$ $\measuredangle$s $\cong$
4. $\overline{DE} \cong \overline{BF}$	4. opp sides ▱ $\cong$
5. $\overline{AE} \cong \overline{CF}$	5. given
6. $\triangle DEA \cong \triangle BFC$	6. SAS $\cong$ SAS

Statements	Reasons
1. $\overline{AE} \cong \overline{CE}$	1. given
2. $\overline{BE} \cong \overline{DE}$	2. given
3. $\overline{AC}$ and $\overline{BD}$ bisect each other	3. def of seg bisector
4. ABCD ▱	4. quad w/ diag that bisect each other is ▱
5. $\angle AED$ is a right $\measuredangle$	5. given
6. $\overline{AC} \perp \overline{BD}$	6. ⊥ lines form right $\measuredangle$s
7. ABCD rhombus	7. ▱ w/ ⊥ diagonals

Unit 8

1) $\frac{25}{50} = \frac{50}{x}$

$2500 = 25x$

$100 = x$

$\frac{16}{12} = \frac{12}{x}$

$x = 9$

$\frac{9}{18} = \frac{18}{9+x}$

$324 = 9(9+x)$

$36 = 9+x$

$27 = x$

$\frac{16}{12} = \frac{12}{x-16}$

$144 = 16(x-16)$

$9 = x-16$

$25 = x$

2. $\frac{x}{6} = \frac{6}{4x}$

$4x^2 = 36$

$x^2 = 9$

$x = 3$

$4x = 12$

3. a) $49 \geq 25+9$ obtuse $\triangle$

b) $7.1^2 \_\_ 6.6^2 + 2.8^2$

$50.41 \_\_ 43.56 + 7.84$

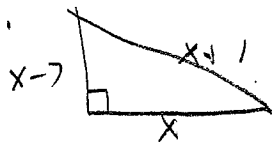
$50.41 < 51.4$ acute $\triangle$

c) $65^2 \_\_ 60^2 + 25^2$

$4225 \_\_ 3600 + 625$

$4225 = 4225$ right $\triangle$

4.



$(x-7)^2 + x^2 = (x+1)^2$

$x^2 - 14x + 49 + x^2 = x^2 + 2x + 1$

$x^2 - 16x + 48 = 0$

$(x-12)(x-4) = 0$

$x = 12$ $x = 4$ reject $4-7<0$

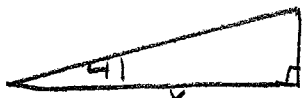
5. $v = 2\sqrt{3}$, $u = 4$ | $u = v = 8$ | $x = y = \frac{4}{\sqrt{2}} = 2\sqrt{2}$

$y = 8$ $x = 8\sqrt{3}$ | $x = y = \frac{2\sqrt{6}}{\sqrt{2}} = 2\sqrt{3}$ | $y = 4\sqrt{5}$ $x = 4\sqrt{15}$

6. $\tan^{-1}\left(\frac{34}{39}\right) = 41.1^\circ$ | $\sin 43 = \frac{x}{22}$ $15.0 = x$ | $\cos^{-1}\left(\frac{26}{45}\right)$ 54.7°

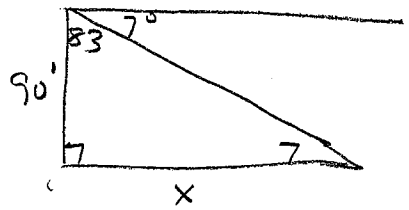
$\sin 46 = \frac{8}{x}$ $x = 11.1$ | $\sin 40 = \frac{x}{19}$ $x = 12.2$ | $\sin^{-1}\left(\frac{14}{24}\right)$ $x = 35.7^\circ$

7.



$\tan 41 = \frac{4000}{x}$ $x = 4601.47$ ft

8.



$\tan 83 = \frac{x}{90}$

$x = 733.5$ ft

Unit 7

1.

2. $12 = 3x - 15$

$27 = 3x$

$x = 9$

3. ratio of perim = ratio corr. sides

$\frac{30}{x} = \frac{12}{7}$

$210 = 12x$

$x = 17.5$

4. $4x + 30 = 5x + 10$

$20 = x$

(corr. $\angle \cong$)

5. $\frac{x}{4} = \frac{x+x+3}{10}$

$\frac{x}{4} = \frac{2x+3}{10}$

$10x = 8x + 12$

$2x = 12$

$x = 6$

6. a) 1:1

b) 3:4

c) 9:16

7. 1. $\overline{DE} \perp \overline{DB}$, $\overline{CB} \perp \overline{BD}$ 1. Given

2. $\angle D$, $\angle B$ are rt $\angle$ 2. def $\perp$ lines

3. $\angle D \cong \angle B$ 3. All rt $\angle \cong$

4. $\angle EAD \cong \angle CAB$ 4. Vert $\angle \cong$

5. $\triangle EDA \sim \triangle CBA$ 5. AA

6. $\frac{DE}{EA} = \frac{BC}{CA}$ 6. corr sides of $\sim \triangle$ are proportional

7. $DE \cdot CA = EA \cdot BC$ 7. Cross mult.

8. 1) $\overline{DIOZ}$ is isos trap 1. Given

$\overline{OZ} \cong \overline{ID}$

2) $\overline{OI} \parallel \overline{ZD}$ 2. def trapezoid

3) $\angle OIT \cong \angle TZD$ 3. If $\parallel$ lines...

$\angle IOT \cong \angle TDZ$ alt int $\angle \cong$

4. $\triangle OIT \sim \triangle DZT$ 4. AA

5. $\frac{OI}{DZ} = \frac{OT}{DT}$ 5) CSSTP

Unit 10 Practice

1. $x = \frac{1}{2}(124) = 62$ | $x = 35$ | $x = 81$ ($\overset{\frown}{LM} = 162$ so $x = \frac{1}{2}\cdot 162$)

$x = 180 - 123 = 57$ | $180 - (73+16) = 91$ | $35 = \frac{1}{2}(9x + 16 - 54)$, $70 = 9x - 38$, $108 = 9x$, $x = 12$

$\frac{70+140}{2} = 10x + 5$ | $14x + 4 = \frac{1}{2}(205 - 85)$, $14x + 4 = 60$, $14x = 56$, $x = 4$ | $8x + 3 = \frac{1}{2}(255 - 105)$, $8x + 3 = 75$, $8x = 72$, $x = 9$

$\frac{210}{2} = 10x + 5$, $105 = 10x + 5$, $x = 10$

7. $\frac{300}{360} \cdot \pi \cdot 8^2 =$ $\frac{5}{6}\pi \cdot 64 = \frac{160\pi}{3}$ in^2

8. $\frac{60}{360} \cdot 2\pi(6) = \frac{1}{6} \cdot 12\pi = 2\pi$

2. $3x + 1x = 360 - (56 + 112)$

$4x = 192$

$x = 48$ $\overset{\frown}{mCB} = 48$

$\overset{\frown}{mAC} = 144$

a) $m\angle CEB = \frac{1}{2}(\overset{\frown}{CB} + \overset{\frown}{AD}) = \frac{1}{2}(48 + 56) = 52$

b) $m\angle BFA = \frac{1}{2}(\overset{\frown}{BCA} - \overset{\frown}{DB}) = \frac{1}{2}(192 - 112) = 40$

c) $m\angle DAC = \frac{1}{2}(\overset{\frown}{DC}) = \frac{1}{2}(112 + 48) = 80$

d) $m\angle BAC = \frac{1}{2}\overset{\frown}{BC} = 24$

e) $m\angle ABF = \frac{1}{2}\overset{\frown}{ADB} = \frac{1}{2}(178) = 89$

3. 11 4. 3 5. $x = 10$ 6. $AP = 24$

Unit 9 Practice

1. $A = \frac{1}{2}\cdot\frac{4}{\sqrt{2}}\cdot\frac{4}{\sqrt{2}} = 4$ $A = 64\pi$ legs $= \ell\sqrt{3}$ and 3, $A = \frac{1}{2}\sqrt{3}\cdot 3 = \frac{3\sqrt{3}}{2}$

2. need to find GP

$\cos(\angle GLP) = \frac{20}{52}$

$\angle GLP = 67.4$

$\tan 67.4 = \frac{GP}{20}$

$GP = 48$

$A = \frac{1}{2}\cdot 20.48 = 480$ u^2

$\tan 53 = \frac{6}{AE}$

$AE = 4.52$

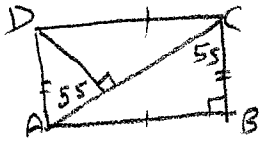
$b_1 = 10$

$b_2 = 10 + 2(4.52)$

19.0

$A = \frac{6}{2}(10 + 19)$

87 u^2



$\sin 55 = \frac{8}{AD}$

$AD = 9.77 = BC$

$\tan 55 = \frac{AB}{CB} = \frac{AB}{9.77}$

$CB = 13.95$

$A = (9.77)(13.95) =$

136.3 u^2

3. rect. solid (prism)

$V = 2\cdot 6\cdot 5 = 60$ km^3

$SA = 2(30) + 2(10) + 2(12)$

$= 60 + 20 + 24$

$= 104$ km^2

LA depends on what you consider the base

pyramid

$V = \frac{1}{3}(81)(9)$

243 m^3

need ℓ

$3^2 + 9^2 = \ell^2$

$9 + 81 = \ell^2$

$\sqrt{90} = \ell$

$SA = 81 + 4\cdot\frac{1}{2}\cdot 9\cdot\sqrt{90}$

$81 + 18\sqrt{90} =$

251.76 in^2

$LA = 170.8$ in^2

cone

$V = \frac{1}{3}\pi 9^2 \cdot 18 = 486\pi \approx 1526.8$ yd^3

$\ell = \sqrt{18^2 + 9^2} = 20.12$

$SA = \pi 9^2 + \pi(9)(20.12) \approx 823.3$ yd^2

$LA = 568.9$ yd^2

cylinder

$V = \pi(10)^2(8) = 800\pi$ ft^3

$SA = 2\pi(10)^2 + 2\pi(10)8 =$

$200\pi + 160\pi = 360\pi$ ft^2

$LA = 160\pi$ ft^2

sphere $V = \frac{4}{3}\pi(6.1)^3 = 950.8$ mi^3

$SA = 4\pi(6.1)^2 = 467.6$ mi^2

Unit 11 Practice

1. $2x+3y=10$
$3y=-2x+10$
$y=-\frac{2}{3}x+\frac{10}{3}$
slope is $-2/3$
line $\parallel$ has slope $-2/3$
$y--7=-\frac{2}{3}(x-6)$ point slope
$y+7=-\frac{2}{3}x+4$
$y=-\frac{2}{3}x-3$ (slope intercept)

2. $8x=2y+5$
$\frac{8x-5}{2}=\frac{2y}{2}$
$4x-\frac{5}{2}=y$
slope is 4
slope of line $\perp$ is $-\frac{1}{4}$
$y-3=-\frac{1}{4}(x--4)$
$y-3=-\frac{1}{4}(x+4)$ pt-slope
$y=-\frac{1}{4}x+2$ slope int.

3. $2x-6y=8$
$2x-8=6y$
$\frac{2}{6}x-\frac{8}{6}=y$
slope $\frac{1}{3}$

$y-3x=6$
$y=3x+6$
slope 3

slopes are not =, and do not mult to -1 so neither

4. $(x+5)^2+(y-2)^2=13$

5. center is mdpt $\left(\frac{3+7}{2},\frac{4+-2}{2}\right)=(5,1)$
radius is $\sqrt{(5-3)^2+(1-4)^2}=\sqrt{4+9}=\sqrt{13}$
eqn $(x-5)^2+(y-1)^2=13$

6. $AB=3\sqrt{2}$
$BC=\sqrt{50}=5\sqrt{2}$
$AC=4\sqrt{2}$
perimeter is $3\sqrt{2}+5\sqrt{2}+4\sqrt{2}=12\sqrt{2}$
Since $(3\sqrt{2})^2+(4\sqrt{2})^2=(5\sqrt{2})^2$
$18+32=50$
$50=50$ ✓
its a rt $\triangle$ so $A=\frac{1}{2}\cdot 3\sqrt{2}\cdot 4\sqrt{2}=$
12

7. mdpt $\left(\frac{11}{2},\frac{-11}{2}\right)$
length $\sqrt{(4-7)^2+(-2--9)^2}=\sqrt{9+49}=\sqrt{58}$

8. slope $\overline{DO}=\frac{7}{1}$
$\parallel$ $\overline{OG}=\frac{3}{4}$
$\parallel$ $\overline{DG}=\frac{4}{3}$
Since slope $\overline{OG}\cdot$ slope $\overline{DG}=-1$
$\overline{OG}\perp\overline{DG}$ so it is a rt $\triangle$.
(could also show converse of Pythag. theorem works)

9. slope $=\frac{6}{6}=1$
$y-1=1(x-3)$ or $y-7=1(x-9)$ pt/slope
$y-1=x-3$
$y=x-2$ slope int.

10. There are a few ways to do this -

A) I will show diagonals bisect each other by showing that the mdpts of diagonals are the same pt.
mdpt $\overline{AC}=\left(\frac{0+5}{2},\frac{0+7}{2}\right)=\left(\frac{5}{2},\frac{7}{2}\right)$
mdpt $\overline{BD}=\left(\frac{2+3}{2},\frac{6+1}{2}\right)=\left(\frac{5}{2},\frac{7}{2}\right)$
> this shows the diags. bisect each other

B) I will show its a rectangle by showing its a $\square$ w/ a rt $\angle$.
slope $\overline{BI}=\frac{6}{4}=\frac{3}{2}$
$\parallel$ $\overline{IR}=\frac{2}{-3}$
$\overline{RD}=\frac{6}{4}=\frac{3}{2}$
$\overline{BD}=\frac{2}{-3}$
Since opp. sides have same slope BIRD is a $\square$
Since slope $\overline{BI}\cdot\overline{IR}=-1$
$\overline{BI}\perp\overline{IR}$ so $\angle I$ is a rt $\angle$ which means it's a rectangle

C) I will show all sides $\cong$
$GO=\sqrt{(1-4)^2+(1--2)^2}=\sqrt{9+9}=\sqrt{18}$
$OA=\sqrt{(4-7)^2+(-2-1)^2}=\sqrt{9+9}=\sqrt{18}$
$AT=\sqrt{(7-4)^2+(1-4)^2}=\sqrt{9+9}=\sqrt{18}$
$GT=\sqrt{(1-4)^2+(1-4)^2}=\sqrt{9+9}=\sqrt{18}$
all sides $\cong$, therefore rhombus.

D) slope $\overline{PI}=\frac{2}{6}=\frac{1}{3}$
slope $\overline{IE}=\frac{12}{6}=2$ slope $\overline{ES}=\frac{-6}{2}=-3$
slope $\overline{PS}=\frac{4}{2}=2$
$\overline{IE}\parallel\overline{PS}$ since slopes are =, $\overline{ES}\not\parallel\overline{PI}$
so its a trapezoid.
legs are $\overline{ES}$, $\overline{PI}$. Show they are =
$ES=\sqrt{(-1-3)^2+(-8--2)^2}=\sqrt{4+36}=\sqrt{40}$
$PI=\sqrt{(-1-5)^2+(2-4)^2}=\sqrt{36+4}=\sqrt{40}$
$ES=PI$ so its an isos. trap.