Make sure that all cell phones are turned off, not set on ring or vibrate. Calculators ARE permitted on this exam.

1. [12 pts - 2 each] Circle the most reasonable measurement:

(a) It's just warm enough in our room now. The indoor temperature is about:

$$20^{\circ} C \qquad 0^{\circ} C \qquad 68^{\circ} C \qquad 32^{\circ} C$$

(b) The area of our classroom chalkboard is about:

 $6 m^2$ $60 m^2$ $6 cm^2$ $60 cm^2$

(c) The length of your forearm is about:

2 m 2 dm 2 cm 2 dkm

(d) The distance from here to the library is about:

 $50 \ km$ $5.0 \ km$ $50 \ m$ $5.0 \ m$

(e) The weight of my cat is about:

 $50 \ kg$ $5.0 \ kg$ $50 \ g$ $5.0 \ g$

(f) The volume of the fountain near the library is about

 $1 \ell \qquad 1 m\ell \qquad 1 k\ell \qquad 1 dk\ell$

2. [10 pts - 2-4 each] Convert exactly; do not round:

(a)
$$1.23 \ km = ___ hm$$

(b) $234 \ \ell = __ \ell$

(b)
$$25.4 \ \ell\ell \equiv$$

- (c) $345 \ dg = \underline{\qquad} mg$
- (d) 34.5 $m^2 = _ cm^2$

- 3. [3 pts] Could pipes of lengths 15 feet, 18 feet, and 34 feet be arranged to form a triangle? Explain.
- 4. [25 pts 3 or 8 each] Convert, rounding to the nearest tenth. Show work as needed.
 (a) 7 hours, 38 minutes to minutes
 - (b) 76,543 feet to miles
 - (c) 123.4 quarts to gallons
 - (d) \$900 dollars per (30-day) month to cents per minute

(e) 82.3 kilograms per square foot to pounds per square inch (1 kg = 2.2 pounds)

5. [5 pts] Tell how many square feet are in a square yard, then clearly explain why.

6. [5 pts] Clearly and thoroughly explain how we derive the formula for the area of a parallelogram from that for a rectangle.

7. [10 pts] Find the perimeter and area of this object, clearly separating your perimeter work and answer from that for area; round to the nearest tenth if necessary.

8. [10 pts] Find the perimeter and area of this object, clearly separating your perimeter work and answer from that for area; round to the nearest tenth if necessary.

9. [10 pts] Find the surface area and volume of the shape below, clearly separating your surface area work and answer from that for volume; round to the nearest tenth if necessary.

10. [10 pts] Find the surface area and volume of the shape below, clearly separating your surface area work and answer from that for volume; round to the nearest tenth if necessary.

$$V_{sphere} = \frac{4}{3}\pi r^3 \qquad SA_{sphere} = 4\pi r^2 \qquad SA_{cone\ side} = \pi r\ell$$