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:

$$
20^{\circ} \mathrm{C} \quad 0^{\circ} \mathrm{C} \quad 68^{\circ} \mathrm{C} \quad 32^{\circ} \mathrm{C}
$$

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

$$
6 \mathrm{~m}^{2} \quad 60 \mathrm{~m}^{2} \quad 6 \mathrm{~cm}^{2} \quad 60 \mathrm{~cm}^{2}
$$

(c) The length of your forearm is about:
$2 m$
$2 d m$
2 cm
2 dkm
(d) The distance from here to the library is about:

$$
\begin{array}{llll}
50 \mathrm{~km} & 5.0 \mathrm{~km} & 50 \mathrm{~m} & 5.0 \mathrm{~m}
\end{array}
$$

(e) The weight of my cat is about:

$$
50 \mathrm{~kg} \quad 5.0 \mathrm{~kg} \quad 50 \mathrm{~g} \quad 5.0 \mathrm{~g}
$$

(f) The volume of the fountain near the library is about
$1 \ell$
$1 \mathrm{~m} \mathrm{\ell}$
$1 k \ell$
1 dkl
2. [10 pts - 2-4 each] Convert exactly; do not round:
(a) $1.23 \mathrm{~km}=$ $\qquad$ hm
(b) $23.4 \mathrm{cl}=$ $\qquad$ $\ell$
(c) $345 d g=$ $\qquad$ $m g$
(d) $34.5 \mathrm{~m}^{2}=$ $\qquad$ $\mathrm{cm}^{2}$
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 ( $1 \mathrm{~kg}=2.2$ 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.

$$
V_{\text {sphere }}=\frac{4}{3} \pi r^{3} \quad S A_{\text {sphere }}=4 \pi r^{2} \quad S A_{\text {cone side }}=\pi r \ell
$$

