Name: _____ _key_ _____ Date: _____

Unit 1 Test Review

1. Daisy got a job selling cell phones. She gets paid a commission for each phone she sells, plus a flat rate for showing up. The amount she gets paid every week can be represented by the expression $20x + 50$. Answer the following questions for this scenario:

   a) What is the meaning of the coefficient in this expression?

   It is the commission she makes per phone (which is why it's multiplied)

   b) What does the constant represent in this situation?

   The flat rate for showing up

2. Simplify the following expression: $\sqrt{6a^5} \cdot 5\sqrt{12b^2}$ $= 5\sqrt{72a^5b^2} = 5 \cdot \sqrt{36} \cdot \sqrt{2} \cdot \sqrt{a^4} \cdot \sqrt{a} \cdot \sqrt{b^2} =$

$5 \cdot 6 \cdot \sqrt{2} \cdot a^2 \cdot \sqrt{a} \cdot b = \boxed{30a^2b\sqrt{2a}}$

3. Simplify the following expression: $9\sqrt{18} - 3\sqrt{50}$

$9 \cdot \sqrt{9} \cdot \sqrt{2} - 3 \cdot \sqrt{25} \cdot \sqrt{2}$

$9 \cdot 3\sqrt{2} - 3 \cdot 5\sqrt{2} = 27\sqrt{2} - 15\sqrt{2} = \boxed{12\sqrt{2}}$

4. Name the polynomial: $-3x^2 - 8x - 3$

   Quadratic Trinomial
   2nd degree   3 terms

5. Convert the following: K H Dk B D C M
   a. 1500dg to hg

   $\boxed{1.5\ hg}$

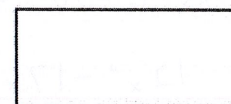   b. 12km to cm   12,00,000

   $\boxed{1,200,000\ cm}$

6. Simplify the expression $(x - 4)^2 = (x-4)(x-4)$

$x^2 - 4x - 4x + 16 = \boxed{x^2 - 8x + 16}$

7. What are the perimeter and area of the rectangle shown? Simplify completely.

   $2x - 5$

   $3x + 4$

Perimeter: $(3x+4) + (2x-5) + (3x+4) + (2x-5) = \boxed{10x - 2}$

Area: $(3x+4)(2x-5) = 6x^2 - 15x + 8x - 20 = \boxed{6x^2 - 7x - 20}$

8. A car is driving at a rate of 3 kilometers per minute. What is the car's speed in meters per hour?
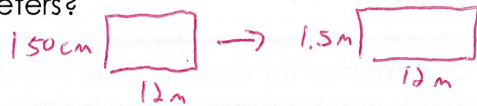
   km → m, min → hrs

   1 kilometer = 1000 meters
   1 hour = 60 minutes

   $\dfrac{3\ km}{1\ min} \cdot \dfrac{1000\ m}{1\ km} \cdot \dfrac{60\ min}{1\ hr} = 180,000\ \text{m}/\text{hr}$

9. A rectangle has a length of 150 centimeters and a width of 12 meters. What is the area of the rectangle in meters?

150 cm ▭ → 1.5m ▭
12m   12m

$1.5(12) = \boxed{18m^2}$

10. If a runner's speed is 20 feet per second, what is their speed in miles per hour?

$Ft \rightarrow mi ; Sec \rightarrow min \rightarrow hr$

1 mile = 5280 feet
1 minute = 60 seconds
1 hour = 60 minutes

$$\frac{20 ft}{1 sec} \cdot \frac{1 mile}{5280 ft} \cdot \frac{60 sec}{1 min} \cdot \frac{60 min}{1 hr} = \frac{72,000}{5,280} = \boxed{13.64 \ ^{mi}/_{hr}}$$

Simplify the radicals:

11. $\sqrt{32z^4}$

$\sqrt{16} \cdot \sqrt{2} \cdot \sqrt{z^4}$
$4\sqrt{2} \cdot z^2$
$\boxed{4z^2\sqrt{2}}$

12. $\sqrt{40a^7}$

$\sqrt{4} \cdot \sqrt{10} \cdot \sqrt{a^6} \cdot \sqrt{a}$
$2 \cdot \sqrt{10} \cdot a^3 \cdot \sqrt{a}$
$\boxed{2a^3\sqrt{10a}}$

13. $5\sqrt{6} - \sqrt{6}$

$\boxed{4\sqrt{6}}$

14. $\sqrt{5} + \sqrt{45}$

$1\sqrt{5} + \sqrt{9} \cdot \sqrt{5}$
$1\sqrt{5} + 3\sqrt{5}$
$\boxed{4\sqrt{5}}$

15. $2\sqrt{3}(4\sqrt{1} - \sqrt{5})$

$\boxed{8\sqrt{3} - 2\sqrt{15}}$

16. $3\sqrt{2} \cdot \sqrt{8}$

$3\sqrt{16}$
$3 \cdot 4$
$\boxed{12}$

Simplify

17. $(5x^2 - 8x - 6) + (7x^2 - 9x - 3)$

$5x^2 - 8x - 6 + 7x^2 - 9x - 3$

$12x^2 - 17x - 9$

18. $(3x^2 + 5x - 9) - (6x^2 + 5x - 11)$

$3x^2 + 5x - 9 - 6x^2 - 5x + 11$

$\boxed{-3x^2 + 2}$

Multiply

19. $7x^2(8x^4 - 5x^2 + 2)$

$\boxed{56x^6 - 35x^4 + 14x^2}$

20. $(x - 4)^2$

$(x-4)(x-4)$
$x^2 - 4x - 4x + 16$
$\boxed{x^2 - 8x + 16}$

21. $(x - 6)(x + 7)$

$x^2 + 7x - 6x - 42$
$\boxed{x^2 + x - 42}$