1. If Josephine reads b books per week and each book has, on average, 100,000 words, which best approximates the number of words Josephine reads per day?

(A) $100,000b$

(B) $\dfrac{100,000b}{7}$

(C) $\dfrac{700,000}{7b}$

(D) $\dfrac{100,000}{100,000b}$

(E) $(7)(24)$

2. A rectangle's width w is twice its length. Which of the following expresses the rectangle's area in terms of w?

(A) w

(B) $2w^2$

(C) $3w^2$

(D) $\dfrac{w^2}{2}$

(E) $\dfrac{w^2}{4}$

3. A clothing store bought a container of 100 shirts for $\$x$. If the store sold all of the shirts at the same price for a total of $\$50$, what is the store's profit per shirt, in dollars, in terms of x?

(A) $50 - \dfrac{x}{100}$

(B) $50 - x$

(C) $5 - x$

(D) $0.5 - x$

(E) $0.5 - \dfrac{x}{100}$

4. There are two trees in the front yard of a school. The trees have a combined height of 60 feet, and the taller tree is x times the height of the shorter tree. How tall is the shorter tree, in terms of x?

(A) $\dfrac{60}{1+x}$

(B) $\dfrac{60}{x}$

(C) x

(D) $60 - 2x$

(E) $30 - 5x$

5. Louise is three times as old as Mary. Mary is twice as old as Natalie. If Louise is L years old, what is the average age of the three women, in terms of L?

(A) $L/3$
(B) $L/2$
(C) $2L/3$
(D) $L/4$
(E) $L/6$

6. Toshi is four times as old as Kosuke. In x years Toshi will be three times as old as Kosuke. How old is Kosuke, in terms of x?

(A) $2x$
(B) $3x$
(C) $4x$
(D) $8x$
(E) $12x$

7. A shirt that costs k dollars is increased by 30%, then by an additional 50%. What is the new price of the shirt in dollars, in terms of k?

(A) $0.2k$
(B) $0.35k$
(C) $1.15k$
(D) $1.8k$
(E) $1.95k$

8. Carlos runs a lap around the track in x seconds. His second lap is five seconds slower than the first lap, but the third lap is two seconds faster than the first lap. What is Carlos's average race time, in *minutes*, in terms of x?

(A) $x - 1$

(B) $x + 1$

(C) $\dfrac{x-1}{60}$

(D) $\dfrac{x+1}{60}$

(E) $\dfrac{x+3}{60}$

9. Andrew sells vintage clothing at a flea market at which he pays $150 per day to rent a table plus $10 per hour to his assistant. He sells an average of $78 worth of clothes per hour. Assuming no other costs, which of the functions below best represents profit per day P in terms of hours h that the flea market table is open for business?

(A) $P(h) = 238 - 10h$
(B) $P(h) = 72 - 10h$
(C) $P(h) = 68h - 150$
(D) $P(h) = 78h - 160$
(E) $P(h) = -160h + 78$

10. If $a, b, c,$ and d are consecutive integers and $a < b < c < d$, what is the average of $a, b, c,$ and d in terms of d?

(A) $d - \dfrac{5}{2}$

(B) $d - 2$

(C) $d - \dfrac{3}{2}$

(D) $d + \dfrac{3}{2}$

(E) $\dfrac{4d - 6}{7}$

11. A cheese that costs c cents per ounce costs how many dollars per pound? (16 ounces = 1 pound and 100 cents = 1 dollar)

(A) $4c/25$
(B) $25c/4$
(C) $25/4c$
(D) $c/1,600$

(E) $1,600c$

12. A bag of snack mix contains 3 ounces of pretzels, 1 ounce of chocolate chips, 2 ounces of mixed nuts, and x ounces of dried fruit by weight. What percent of the mix is dried fruit, by weight?

(A) $\dfrac{x}{600}$

(B) $\dfrac{100}{6x}$

(C) $\dfrac{100x}{6}$

(D) $\dfrac{100x}{6+x}$

(E) $\dfrac{x}{100(6+x)}$

13. At her current job, Mary gets a 1.5% raise twice per year. Which of the following choices represents Mary's current income y years after starting the job at a starting salary of s?

(A) $s(1.5)^{2y}$
(B) $s(0.015)^{2y}$
(C) $s(1.015)^{2y}$
(D) $s(1.5)^{y/2}$
(E) $s(1.015)^{y/2}$

14. Phone Plan A charges $1.25 for the first minute and $0.15 for every minute thereafter. Phone Plan B charges a $0.90 connection fee and $0.20 per minute. Which of the following equations could be used to find the length, in minutes, of a phone call that costs the same under either plan?

(A) $1.25 + 0.15x = 0.90x + 0.20$
(B) $1.25 + 0.15x = 0.90 + 0.20x$
(C) $1.25 + 0.15(x - 1) = 0.90 + 0.20x$
(D) $1.25 + 0.15(x - 1) = 0.90 + 0.20(x - 1)$
(E) $1.25 + 0.15x + 0.90x + 0.20 = x$

15. If powdered drink mix costs c cents per ounce and p pounds of it are purchased by a supplier who intends to resell it, what will be the total revenue, in dollars, in terms of c and p if all of the drink mix is sold at a price per ounce equivalent to three times what the supplier paid? (16 ounces = 1 pound and 100 cents = 1 dollar)

(A) $\dfrac{48cp}{32cp}$

(B) $\dfrac{100}{100(32)}$

(C) $\dfrac{cp}{12cp}$

(D) $\dfrac{25}{25cp}$

(E) 12

16.
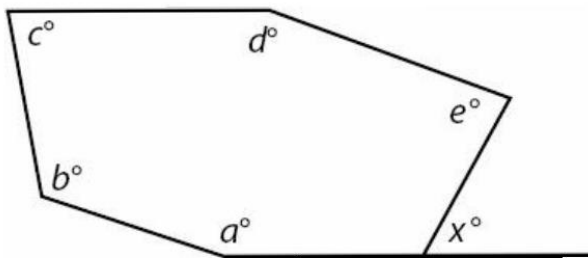
16. If $d = 2c$ and $e = \dfrac{1}{2}a$, what is x in terms of a, b, and c?

(A) $\dfrac{3}{2}a + b + 3c - 540$

(B) $\dfrac{3}{2}a + b + 3c$

(C) $720 - \dfrac{3}{2}a - b - 3c$

(D) $720 - \dfrac{1}{2}a - b - 2c$

(E) $540 - \dfrac{1}{2}a - b - \dfrac{3}{2}c$

17. a, b, and c are 3 consecutive odd integers such that $a < b < c$. If a is halved to become m, b is doubled to become n, c is tripled to become p, and $k = mnp$, which of the following is equal to k in terms of a?

   (A) $3a^3 + 18a^2 + 24a$
   (B) $3a^3 + 9a^2 + 6a$
   (C) $\dfrac{11}{2}a + 16$
   (D) $6a^2 + 36a + 24$
   (E) $a^3 + 6a^2 + 4a$

18. If m pencils cost the same as n pens, and each pencil costs 20 cents, what is the cost, in dollars, of 10 pens, if each pen costs the same amount (100 cents = 1 dollar)?

   (A) $\dfrac{200n}{m}$

   (B) $\dfrac{2n}{100m}$

   (C) $\dfrac{2m}{n}$

   (D) $\dfrac{2n}{m}$

   (E) $200mn$

19. Randi sells forklifts at a dealership where she makes a base salary of \$2,000 per month, plus a commission equal to 5% of the selling price of the first 10 forklifts she sells that month, and 10% of the value of the selling price of any forklifts after that. If all forklifts have the same sale price, s, which of the choices below represents Randi's monthly pay, P, as a function of number of forklifts sold, f, in months in which she sells more than 10 forklifts? (Assume Randi's pay is made up entirely of base salary and commission, and no deductions are taken from this pay.)

(A) $P = 2{,}000 + 0.05sf + 0.10sf$
(B) $P = 2{,}000 + 0.05sf + 0.10s(f - 10)$
(C) $P = 2{,}000 + 0.05s + 0.10s(f - 10)$
(D) $P = 2{,}000 + 0.5s + 0.10sf - 10$
(E) $P = 2{,}000 + 0.5s + 0.10s(f - 10)$

20. If the width of a rectangle is w, the length is l, the perimeter is p, and $w = 2l$, what is the area in terms of p?

(A) $\dfrac{p^2}{18}$

(B) $\dfrac{p^2}{36}$

(C) $\dfrac{p}{9}$

(D) $\dfrac{p^2}{9}$

(E) $\dfrac{p}{6}$