

Keystone Review: Operations with Real #s and Expressions

$$\textcircled{1} \quad \sqrt{4(9)} + 5$$

$$\sqrt{36} + 5$$

$$6 + 5$$

B. 11

$$\textcircled{2} \quad 8^4 \cdot 8^3$$

$$8^{4+3}$$

B. 8^7

$$\textcircled{3} \quad 7\sqrt{54} - 2\sqrt{24}$$

$$9^{\wedge}6 \quad 2^{\wedge}12$$

$$3^{\wedge}3 \quad 2^{\wedge}3$$

$$7 \cdot 3 \cdot \sqrt{6} - 2 \cdot 2 \cdot \sqrt{6}$$

$$21\sqrt{6} - 4\sqrt{6}$$

C. $17\sqrt{6}$

$$\textcircled{4} \quad \sqrt{85x} \quad x = 185$$

$$5^{\wedge}17 \quad 5^{\wedge}37$$

$$\sqrt{85 \cdot 185}$$

$$5^{\wedge}17 \quad 5^{\wedge}37$$

A. 185

$$5\sqrt{17 \cdot 37}$$

$$5\sqrt{629}$$

$$\textcircled{5} \quad -0.9x^2 - 4.5x + 12.6$$

$$-0.9(x^2 + 5x - 14)$$

D. $-0.9(x+7)(x-2)$

$$\textcircled{6} \quad \frac{2}{3} = 0.66666$$

$$0.56 = 0.56$$

$$14\% = 0.14$$

$$77\% = 0.77$$

$$\frac{1}{2} = 0.5$$

$$\textcircled{7} \quad 80\% \text{ of } 146$$

$$0.8(146)$$

$$116.8$$

$$0.14, 0.5, 0.56, 0.\bar{6}, 0.77$$

B. $14\%, \frac{1}{2}, 0.56, \frac{2}{3}, 77\%$

$$(116.8)(8) = 934.4$$

B. 934

$$\textcircled{8} \quad \frac{38+50}{2} = 44$$

approximately 44 miles every 2 hrs
(so 22 mph)

$$52 \text{ miles} + 4(22)$$

$$52 + 88$$

140 miles

B. 142 miles

$$\textcircled{9} \quad 2|3-6(2)| + |2|$$

$$2|3-12| + 2$$

$$2|-9| + 2$$

$$2(9) + 2$$

$$18 + 2$$

A. 20

$$\textcircled{10} \quad \frac{3x^3 + 18x^2 - 15x}{3x}$$

3x

$$\frac{3x^3}{3x} + \frac{18x^2}{3x} - \frac{15x}{3x}$$

$$\frac{\cancel{3} \cdot \cancel{x} \cdot x \cdot x}{\cancel{3} \cdot \cancel{x}} + \frac{\cancel{3} \cdot 6 \cdot x \cdot x}{\cancel{3} \cdot \cancel{x}} - \frac{\cancel{3} \cdot 5 \cdot x}{\cancel{3} \cdot \cancel{x}}$$

B. $x^2 + 6x - 5$

$$\textcircled{11} \quad 7x^2 - 2x^2 = 5x^2$$

$$6x - (-3x) = 9x$$

$$3 - 7 = -4$$

B. $5x^2 + 9x - 4$

$$\textcircled{12} \quad 16x^2 + 20x$$

$$\begin{matrix} (2)(2) & 2 \cdot 2 \cdot x & = 16x^2 \\ (2)(2) & 5 \cdot x & = 20x \end{matrix}$$

C. $4x(4x+5)$

$$\textcircled{13} \quad \begin{matrix} & x^4 & - & 1 \\ & \wedge & & \wedge \\ x^2 & & x^2 & & 1 & & 1 \\ & \wedge & & \wedge \\ & x^2 & & - & 1 \end{matrix}$$

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

$$\begin{matrix} & \wedge & & \wedge \\ & x & & x \\ & & & 1 & & 1 \end{matrix}$$

B. $(x^2 + 1)(x + 1)(x - 1)$

- customers
 (14) 40 hrs per week; abt 6[^] per hour
 $40 \cdot 6 = 240$ customers/wk

$$\frac{2}{3} (240) = 160$$

A. 160

(15) $4(13 - |-9 + 4|) - |9 - 7|^2$
 $4(13 - |-5|) - 2^2$
 $4(13 - 5) - 4$
 $4(8) - 4$
 $32 - 4$

B. 28

(16) $(2 \cdot r^t)^{-2}$
 $(2 \cdot 3^2)^{-2}$
 $(2 \cdot 9)^{-2}$

D

$$18^{-2} = \frac{1}{18^2} = \frac{1}{324}$$

(17) $(6x^2 - 8x - 1)(2x - 5)$
 $12x^3 - 30x^2 - 16x^2 + 40x - 2x + 5$

D. $12x^3 - 46x^2 + 38x + 5$

$$\begin{aligned} 6x^2 \cdot 2x &= 12x^3 \\ 6x^2 \cdot (-5) &= -30x^2 \\ -8x \cdot 2x &= -16x^2 \\ -8x \cdot (-5) &= 40x \\ -1 \cdot 2x &= -2x \\ -1 \cdot (-5) &= 5 \end{aligned}$$

(18) $14x^3 y^3 z^2 = 2 \cdot 7 \cdot x \cdot x \cdot x \cdot y \cdot y \cdot y \cdot z \cdot z$
 $22xy^2 = 2 \cdot 11 \cdot x \cdot y \cdot y$

A. $2xy^2$

(19) A

$$6u^2 v^2 w^3$$

$$10u^3 v w^4$$

6, 12, 18, 24, (30)

10, 20, (30)

(20) $\frac{2x^2 + 12x + 16}{2x^2 + 4x - 16} = \frac{2(x^2 + 6x + 8)}{2(x^2 + 2x - 8)}$

$$= \frac{(x+4)(x+2)}{(x+4)(x-2)} = \frac{x+2}{x-2} \quad B$$

② a. Volume = length · width · height

$$V = x(3x-2)(2x+1)$$

$$V = (3x^2 - 2x)(2x+1)$$

$$V = 6x^3 + 3x^2 - 4x^2 - 2x$$

$$\begin{aligned} 3x^2 \cdot 2x &= 6x^3 \\ 3x^2 \cdot 1 &= 3x^2 \\ -2x \cdot 2x &= -4x^2 \\ -2x \cdot 1 &= -2x \end{aligned}$$

$$V = 6x^3 - x^2 - 2x$$

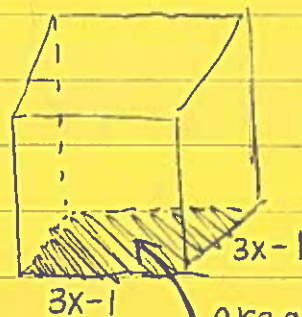
FACTOR! b. Area = length · width

$$\rightarrow 9x^2 - 6x + 1 = \text{length} \cdot \text{width}$$

$$\begin{array}{c} \wedge \\ 3x \quad 3x \end{array}$$

$$\begin{array}{c} \wedge \\ 1 \quad 1 \end{array}$$

$$(3x-1)(3x-1)$$

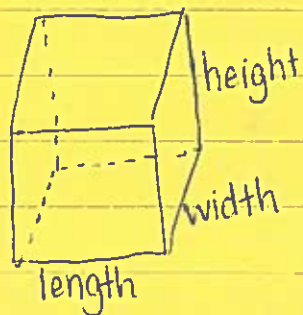


area of square base

one side length of the square base is $3x-1$

c. height = $2x+1$

$$\text{Volume} = 6x^3 + 15x^2 + 6x$$



new length

$$3x$$

$$(2x^2 + 5x + 2)$$

factor out a common factor

width · height

$$3x(x+2)(2x+1)$$

$$(x+2)(2x+1)$$

$$2x^2 + x + 4x + 2$$

$$2x^2 + 5x + 2$$

largest coefficient so this is the length of the box