

Student Number: 000000

Date _____

1. $-5 + (-12) = -5 - 12$ loss of 5, loss of 12 $\rightarrow$ answer must be negative

- a) -17 b) -7 ~~c) 7~~ ~~d) 17~~ ~~e) 60~~

2. $-91 + 54 = -37$ loss of 91, gain of 54 $\rightarrow$ answer must be negative

- a) -145 b) -47 c) -37 ~~d) 37~~ ~~e) 47~~

3. $84 + (-23) = 84 - 23$ gain of 84, loss of 23 $\rightarrow$ answer must be positive

- ~~a) -107~~ ~~b) -61~~ c) 51 d) 61 e) 107

4. $-32 - 29 = -61$ loss of 32, loss of 29 $\rightarrow$ answer must be negative

- a) -61 b) -51 ~~c) -3~~ too large ~~d) 3~~ ~~e) 61~~

5. $23 - (-94) = 23 + 94$ gain of 23, gain of 94 $\rightarrow$ answer must be positive

- ~~a) -117~~ ~~b) -71~~ c) 71 d) 117 e) 127

6. $-50 - (-49) = -50 + 49$ loss of 50, gain of 49 $\rightarrow$ answer must be negative

- a) -99 b) -1 ~~c) 1~~ ~~d) 51~~ ~~e) 99~~

7. $23 - (16 - 7) = 23 - 9$ $\rightarrow$ answer must be positive

- ~~a) -32~~ ~~b) -14~~ c) 0 d) 8 e) 14

8. $(-8 - 3) - [10 - (-12)] = -11 - (10 + 12) = -11 - 22$ $\rightarrow$ answer must be negative

- a) -33 b) -11 c) -9 ~~d) 9~~ ~~e) 11~~

9. $-15 \times 6 =$ answer must be negative

- a) -90 b) -21 c) -9 d) $-\frac{5}{3}$ ~~e) 90~~

10. $-18 \times (-6) =$ answer must be positive

- ~~a) -108~~ ~~b) -68~~ ~~c) -24~~ too small ~~d) 24~~ e) 108

11. In which order should the operations $+$, $-$, and $\div$ be inserted into the blanks of $78 - 24 \div 2 + 6 = 72$ to make the statement true?

- a) $+$, $-$, $\div$ b) $-$, $+$, $\div$ c) $-$, $\div$, $+$ d) $+$, $\div$, $-$ e) $\div$, $-$, $+$

12. $-4 \times (-8 + (-3)) = -4 \times (-8 - 3) = -4(-11) = 44$

- a) -44 b) -35 c) 29 d) 44 e) 55

13. $(-48 \div (-4)) \div 2 = 12 \div 2 = 6$

- a) -24 b) -6 c) 6 d) 12 e) 24

$$14. \frac{2(-3)(-4)}{6(-2)} = \frac{24}{-12} = -2$$

a) -2

b) -1

c) $-\frac{1}{2}$

d) 1

e) 2

$$15. \text{ Evaluate: } 32 - \frac{72}{8 \times 3} + 4 \times 6 = 32 - \frac{72}{24} + 24 = 32 - 3 + 24 = 29 + 24 = 53$$

a) $22\frac{1}{3}$

b) 43

c) 53

d) 99

e) 198

$$16. \text{ Evaluate: } \{[4 \times 3 + 14] \div 13\} + 4 \times 7 = \{(12 + 14) \div 13\} + 28 = 26 \div 13 + 28 = 2 + 28$$

a) 18

b) 30

c) 32

d) 42

e) 45

$$17. 6 - 2 \times 3^2 + 24 \div 6 = 6 - 2(9) + 4 = 6 - 18 + 4 = -12 + 4 = -8$$

a) -8

b) 10

c) 40

d) 28

e) 148

18. Which of the following has the greatest value?

a) $2 - 8 \times (-4) - 6 = 28$

b) $(2 - 8) \times (-4) - 6 = 18$

c) $(2 - 8) \times (-4 - 6) = 60$

d) $2 - (8 \times (-4) - 6) = 40$

e) $2 - (-4 - 6 \times 8) = 54$

Work shown below

$$2 - (-4 - 6 \times 8)$$

$$= 2 - (-4 - 48)$$

$$= 2 - (-52)$$

$$= 2 + 52$$

$$= 54$$

Grade 9 Academic
Fractions and Decimals

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1. $\frac{2}{3} + \frac{3}{4} = \frac{2 \times 4}{3 \times 4} + \frac{3 \times 3}{4 \times 3} = \frac{8}{12} + \frac{9}{12} = \frac{17}{12}$

a) $\frac{1}{2}$

~~b) $\frac{5}{7}$~~

☒ c) $\frac{17}{12}$

~~d) $\frac{17}{7}$~~

e) $\frac{7}{2}$

2. $-\frac{1}{4} + (-\frac{2}{5}) = -\frac{1 \times 5}{4 \times 5} - \frac{2 \times 4}{5 \times 4} = -\frac{5}{20} - \frac{8}{20} = -\frac{5+8}{20} = -\frac{13}{20}$

☒ a) $-\frac{13}{20}$

b) $-\frac{7}{20}$

c) $-\frac{1}{3}$

d) $-\frac{3}{10}$

e) $\frac{23}{20}$

3. $-3\frac{1}{2} + (-2\frac{1}{3}) = -\frac{7 \times 3}{2 \times 3} - \frac{7 \times 2}{3 \times 2} = -\frac{21}{6} - \frac{14}{6} = -\frac{21+14}{6} = -\frac{35}{6} = -5\frac{5}{6}$

~~a) $-6\frac{4}{5}$~~

☒ b) $-5\frac{5}{6}$

c) $-1\frac{1}{6}$

~~d) $1\frac{1}{6}$~~

~~e) $5\frac{5}{6}$~~

4. $-\frac{2}{3} + \frac{1}{2} = -\frac{2}{3} + \frac{1}{2} = -\frac{4}{6} + \frac{3}{6} = \frac{-4+3}{6} = -\frac{1}{6}$

~~a) $-\frac{3}{5}$~~

b) $-\frac{1}{5}$

☒ c) $-\frac{1}{6}$

~~d) $\frac{1}{6}$~~

~~e) $\frac{1}{5}$~~

5. $\frac{3}{4} - \frac{2}{3} = \frac{9}{12} - \frac{8}{12} = \frac{1}{12}$

a) $\frac{5}{7}$

b) $\frac{1}{2}$

c) $\frac{5}{12}$

d) $\frac{1}{7}$

☒ e) $\frac{1}{12}$

6. $-\frac{7}{8} - 3\frac{1}{5} = -\frac{7}{8} - \frac{16}{5} = -\frac{35}{40} - \frac{128}{40} = -\frac{163}{40}$

a) $-5\frac{1}{40}$

☒ b) $-4\frac{3}{40}$

c) $-\frac{9}{13}$

~~d) $\frac{9}{13}$~~

~~e) $4\frac{3}{40}$~~

7. $1.8 - (-0.912) = 1.8 + 0.912$

~~a) -2.712~~

~~b) -0.888~~

c) 0.888

d) 2.612

☒ e) 2.712

8. $-1.3 \times 0.07 =$

a) -0.91

☒ b) -0.091

c) -0.0091

~~d) 0.091~~

~~e) 0.91~~

9. $-\frac{3}{5} \times (-\frac{6}{15}) = \frac{18 \div 3}{75 \div 3} = \frac{6}{25}$

~~a) $-\frac{18}{25}$~~

~~b) $-\frac{3}{25}$~~

☒ c) $\frac{6}{25}$

d) $\frac{1}{2}$

e) $\frac{18}{25}$

10. $-2\frac{1}{3} \times (-1\frac{1}{14}) = -\frac{7}{3} \times (-\frac{15}{14}) = \frac{105 \div 21}{42 \div 21} = \frac{5}{2}$

~~a) $-\frac{5}{6}$~~

~~b) $-\frac{2}{5}$~~

c) $\frac{5}{6}$

d) $\frac{53}{42}$

☒ e) $\frac{5}{2}$

11. $-13.2 \div (-12) =$

$132 \div 12 = 11$

~~a) -11~~

~~b) -1.1~~

☒ c) 1.1

d) 1.2

e) 11

12. $-2\frac{3}{4} \div (-4\frac{1}{3}) =$

~~a) $-\frac{52}{33}$~~

~~b) $-\frac{33}{52}$~~

☒ c) $\frac{33}{52}$

d) $\frac{9}{8}$

e) $\frac{52}{33}$

$-\frac{11}{4} \div (-\frac{13}{3}) = -\frac{11}{4} \times (\frac{3}{-13}) = \frac{33}{52}$

Pythagorean

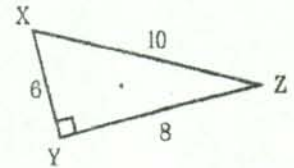
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1. What is the length of the
- hypotenuse
- in
- $\triangle XYZ$
- ?

a) 6 b) 8 **c) 10** d) 12 e) 14

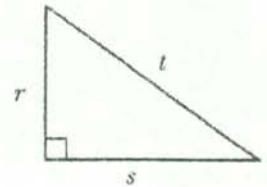
longest side of a right triangle (the side opposite the right angle)



2. For this triangle, which statement demonstrates the Pythagorean Property?

a) $r^2 + t^2 = s^2$ b) $s^2 + t^2 = r^2$ **c) $r^2 + s^2 = t^2$**
 d) $s = r + 0$ e) $s = r + t$

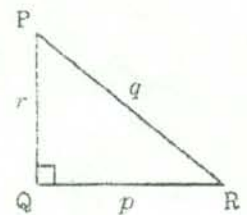
length of hypotenuse



3. In the figure,
- $r = 16$
- and
- $p = 30$
- . What is the length of the hypotenuse of
- $\triangle PQR$
- ?

a) 26 b) 32 **c) 34** d) 46 e) 50

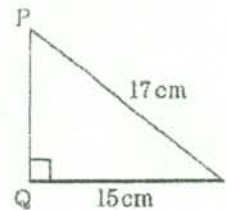
$$\begin{aligned} q^2 &= r^2 + p^2 \\ \therefore q^2 &= 16^2 + 30^2 \\ \therefore q^2 &= 256 + 900 \\ \therefore q^2 &= 1156 \\ \therefore q &= \sqrt{1156} = 34 \end{aligned}$$



4. In the right triangle shown, what is the length of PQ?

a) 2 cm b) 4 cm c) 8 cm d) 16 cm e) $\sqrt{514}$ cm

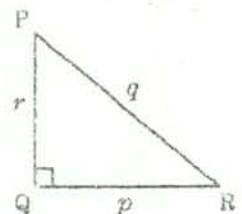
$$\begin{aligned} 17^2 &= PQ^2 + 15^2 \\ \therefore 289 &= PQ^2 + 225 \\ \therefore PQ^2 &= 289 - 225 \\ \therefore PQ^2 &= 64 \\ \therefore PQ &= \sqrt{64} = 8 \end{aligned}$$



5. In
- $\triangle PQR$
- ,
- $r = 9$
- and
- $q = 41$
- . Calculate the length of side
- p
- .

a) 32 **b) 40** c) 43 d) 50 e) 53

$$\begin{aligned} q^2 &= r^2 + p^2 \\ \therefore 41^2 &= 9^2 + p^2 \\ \therefore 1681 &= 81 + p^2 \\ \therefore p^2 &= 1681 - 81 \\ \therefore p^2 &= 1600 \\ \therefore p &= \sqrt{1600} = 40 \end{aligned}$$

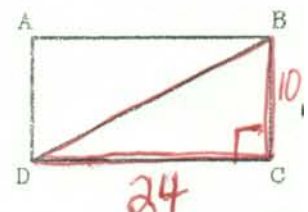


6. ABCD is a rectangle. DC = 24 and BC = 10. What is the length of the hypotenuse in
- $\triangle BCD$
- ?

a) 17 b) 23 c) 26 d) 32 e) 196

Hypotenuse $\rightarrow$ BD

$$\begin{aligned} BD^2 &= 10^2 + 24^2 \\ \therefore BD^2 &= 100 + 576 \\ \therefore BD^2 &= 676 \\ \therefore BD &= \sqrt{676} = 26 \end{aligned}$$



7. What is the length, rounded to the nearest tenth, of the hypotenuse in $\triangle ACD$?

a) 3.5

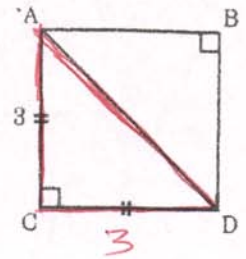
b) 4.2

c) 6.1

d) 9.7

e) 10.6

$$\begin{aligned} AD^2 &= AC^2 + CD^2 \rightarrow \therefore AD^2 = 9 + 9 \\ \therefore AD^2 &= 3^2 + 3^2 \\ \therefore AD^2 &= 18 \\ \therefore AD &= \sqrt{18} \approx 4.2 \end{aligned}$$



8. Find the value of x to the nearest metre.

a) 46 m

b) 50 m

c) 64 m

d) 70 m

e) 92 m

$$\begin{aligned} 114^2 &= x^2 + 90^2 \\ \therefore 12996 &= x^2 + 8100 \\ \therefore x^2 &= 12996 - 8100 \\ \therefore x^2 &= 4896 \\ \therefore x &= \sqrt{4896} \approx 70 \end{aligned}$$

